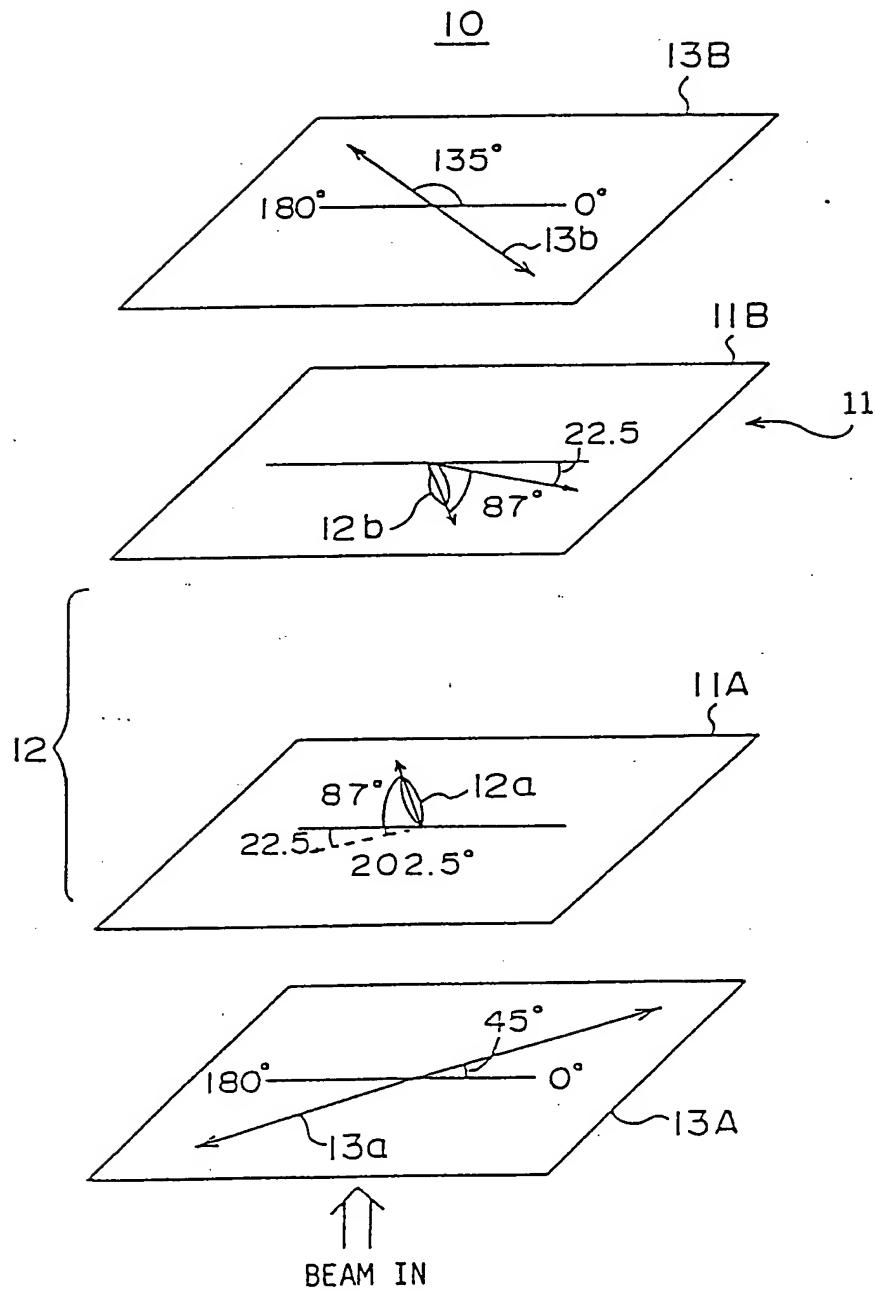


FIG. 1



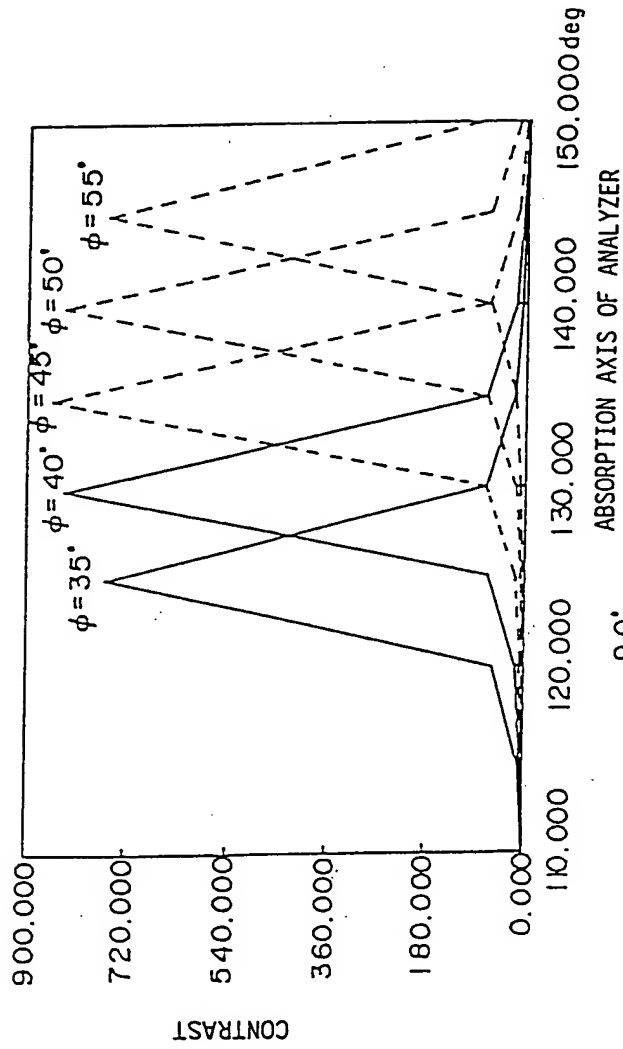


FIG. 2A

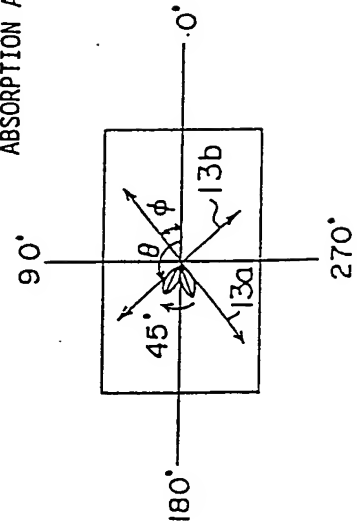


FIG. 2B

FIG. 3A

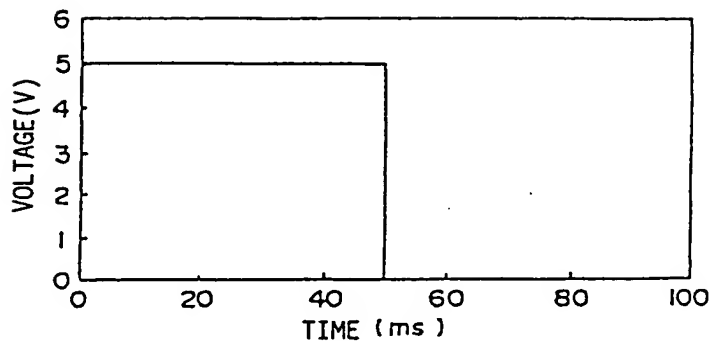


FIG. 3B

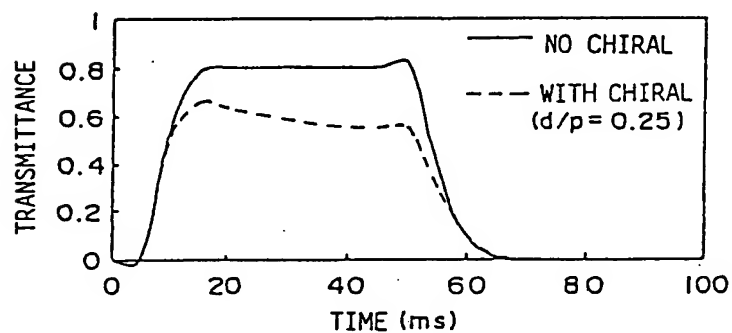


FIG. 3C

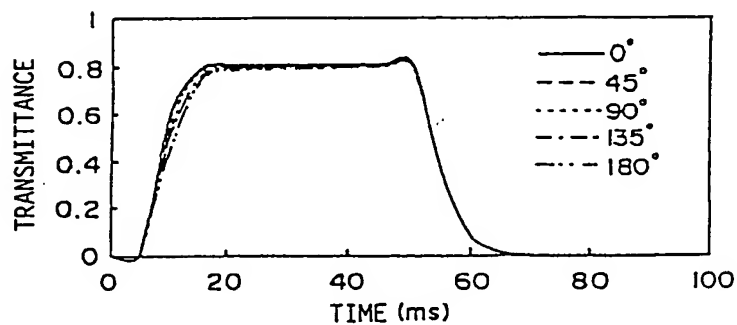
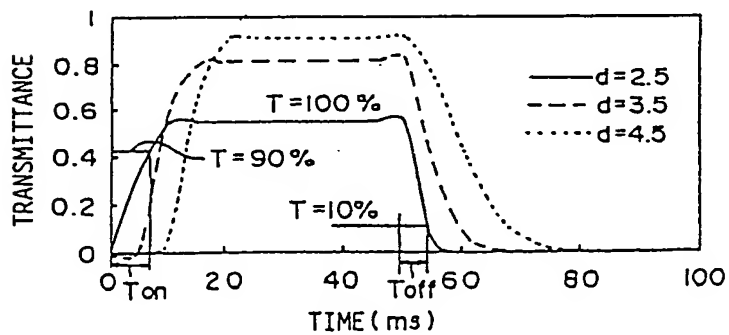


FIG. 3D



8F 96-04267

【図 4】

LIQUID CRYSTAL DISPLAY...  
Osumi et al.  
Greer, Burns & Crain, Ltd.  
Our Ref. No. 0941.68342  
Sheet 4 of 95

Div. Of Serial No. 08/939,822  
(James K. Folker)  
(312) 360-0080

負の誘電率異方性を有する液晶を使った本発明のVAモード  
液晶表示装置の動作を説明する図

FIG 4A  
(A)

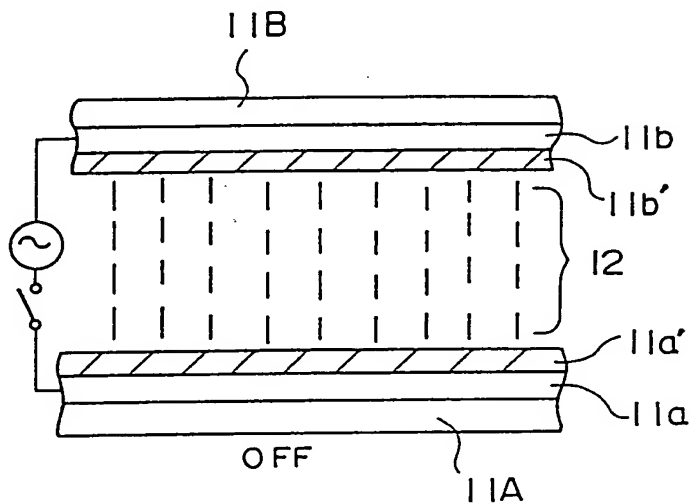
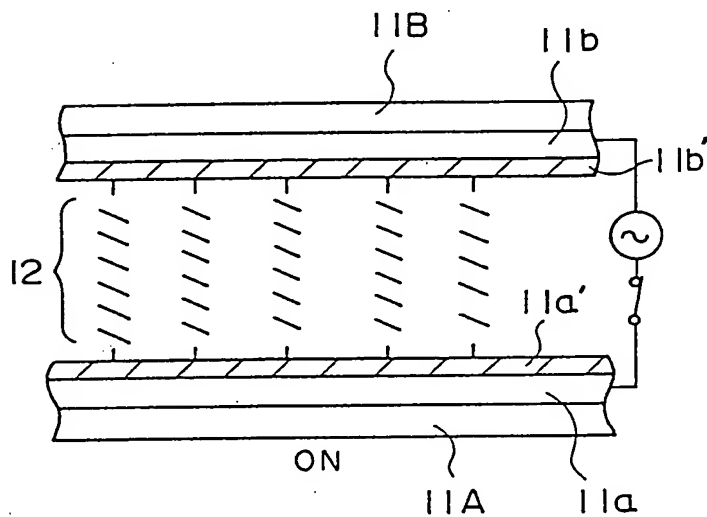


FIG 4B  
(B)



SF96-04267

【図 5】

LIQUID CRYSTAL DISPLAY...  
Ohmuro et al.  
Greer, Burns & Crain, Ltd.  
Our Ref. No. 0941.68342  
Sheet 5 of 95

Div. Of Serial No. 08/939,822  
(James K. Foiker)  
(312) 360-0080

正の誘電率異方性を有する液晶を使った本発明のV Aモード  
液晶表示装置の動作を説明する図

FIG 5A  
(A)

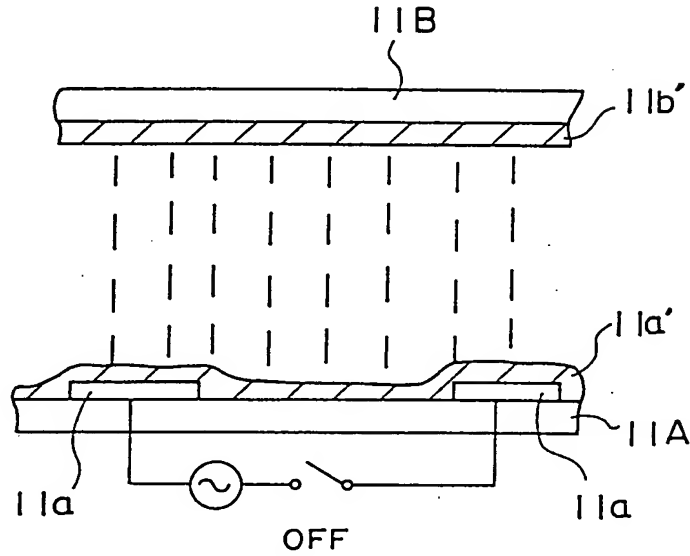
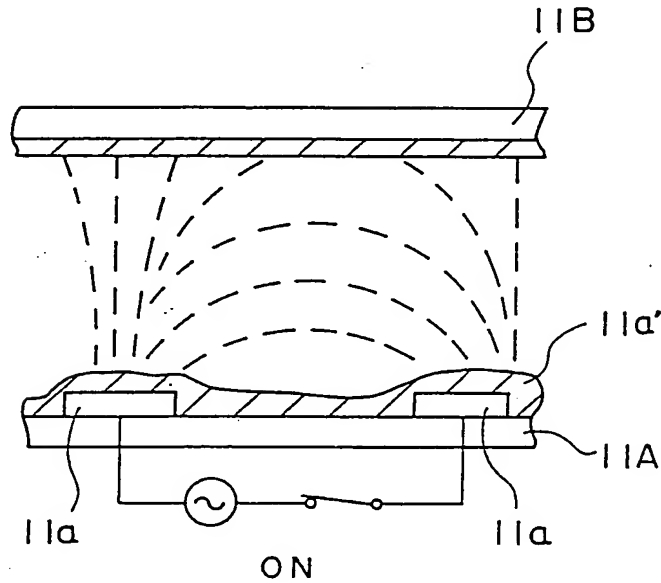


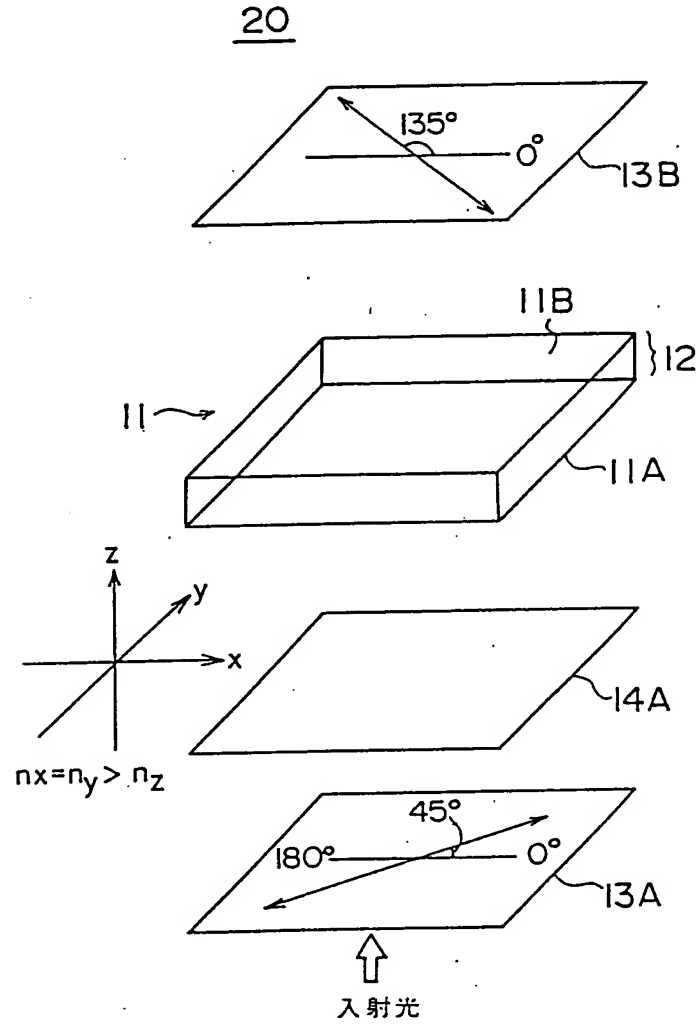
FIG 5B  
(B)



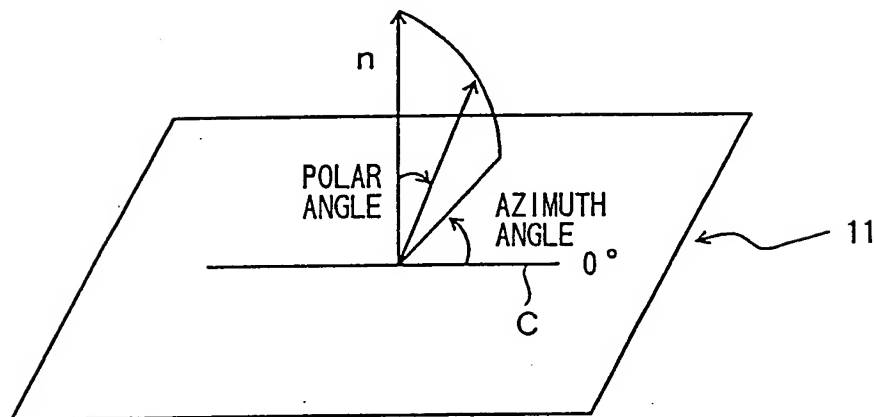
【図 6】

FIG 6A

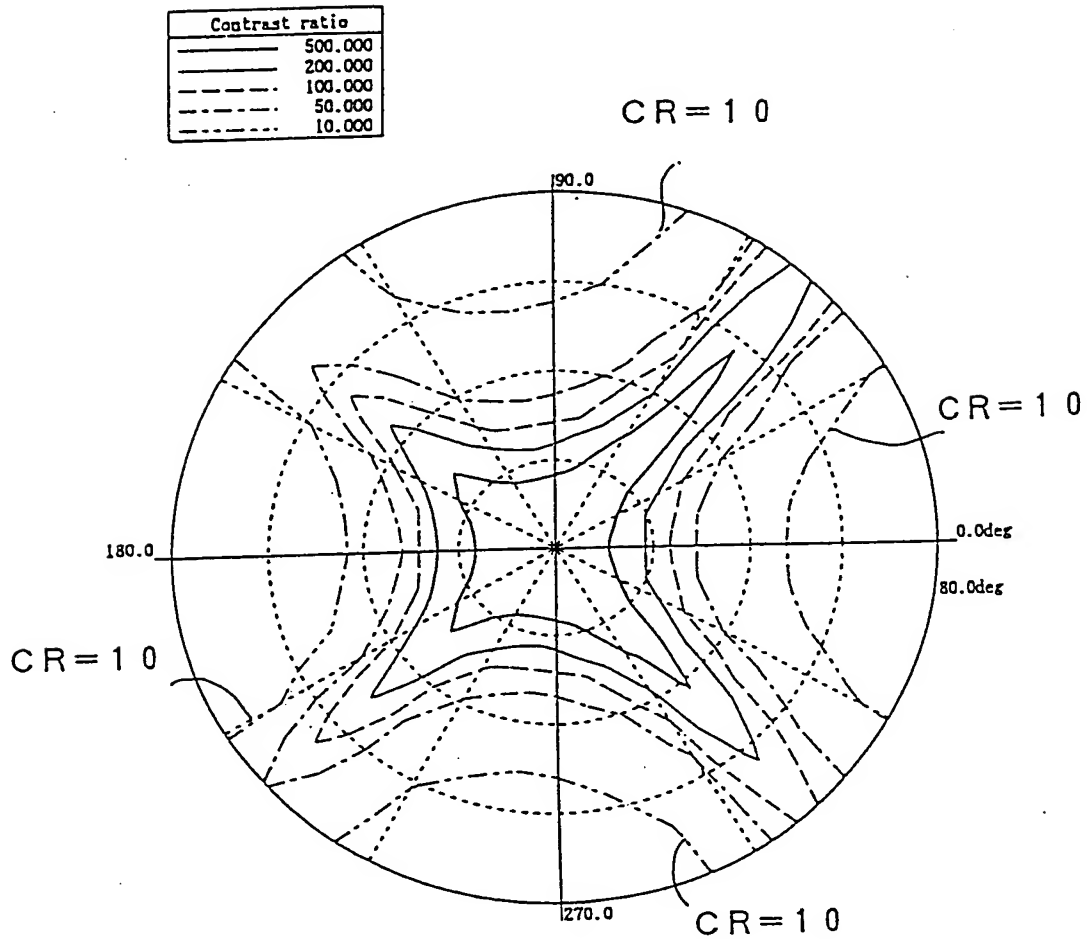
図 1 の液晶表示装置において、さらに位相差補償板を  
 設けた構成を示す図



6B  
FIG. 4B

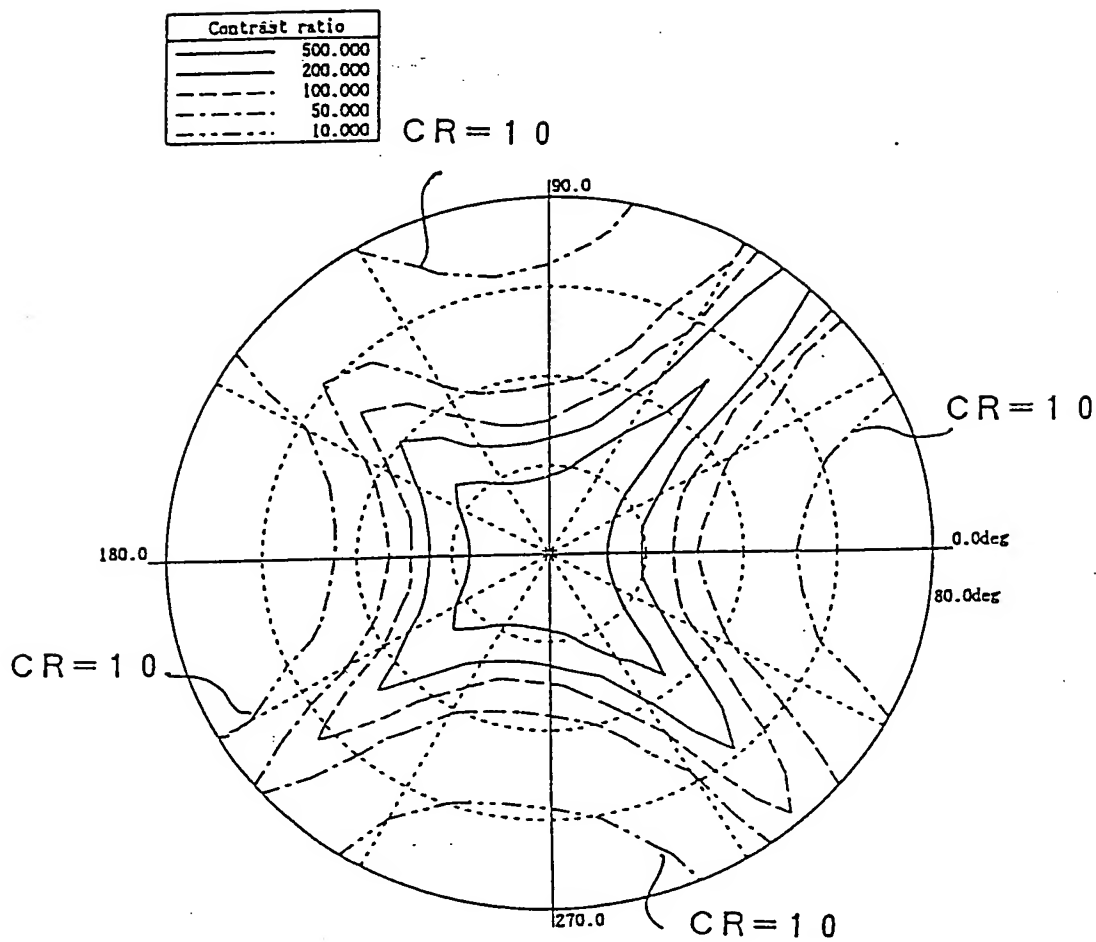


7  
 FIG. 5



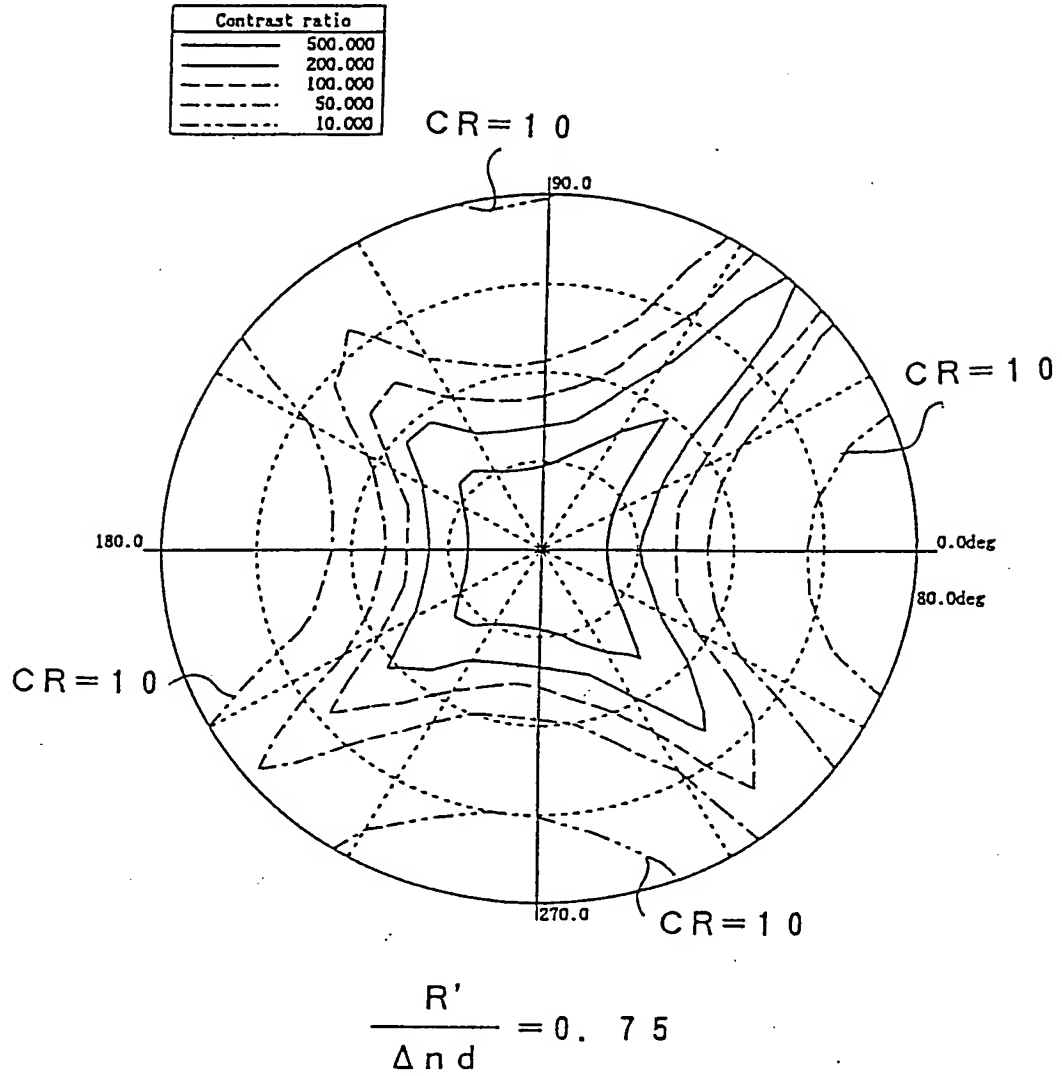
$$\frac{R'}{\Delta n d} = 0.45$$

8  
 FIG. 8

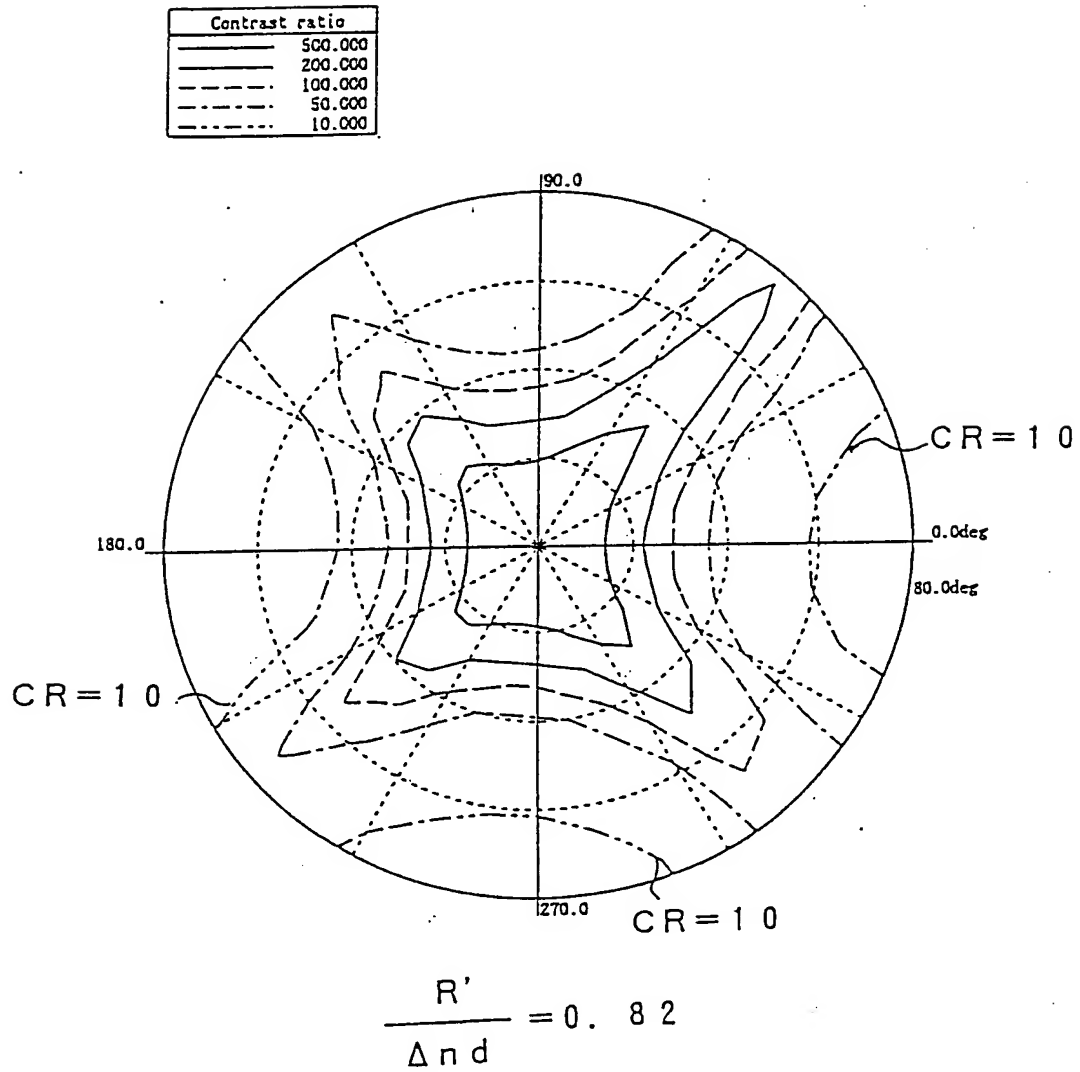


$$\frac{R'}{\Delta n d} = 0.6$$

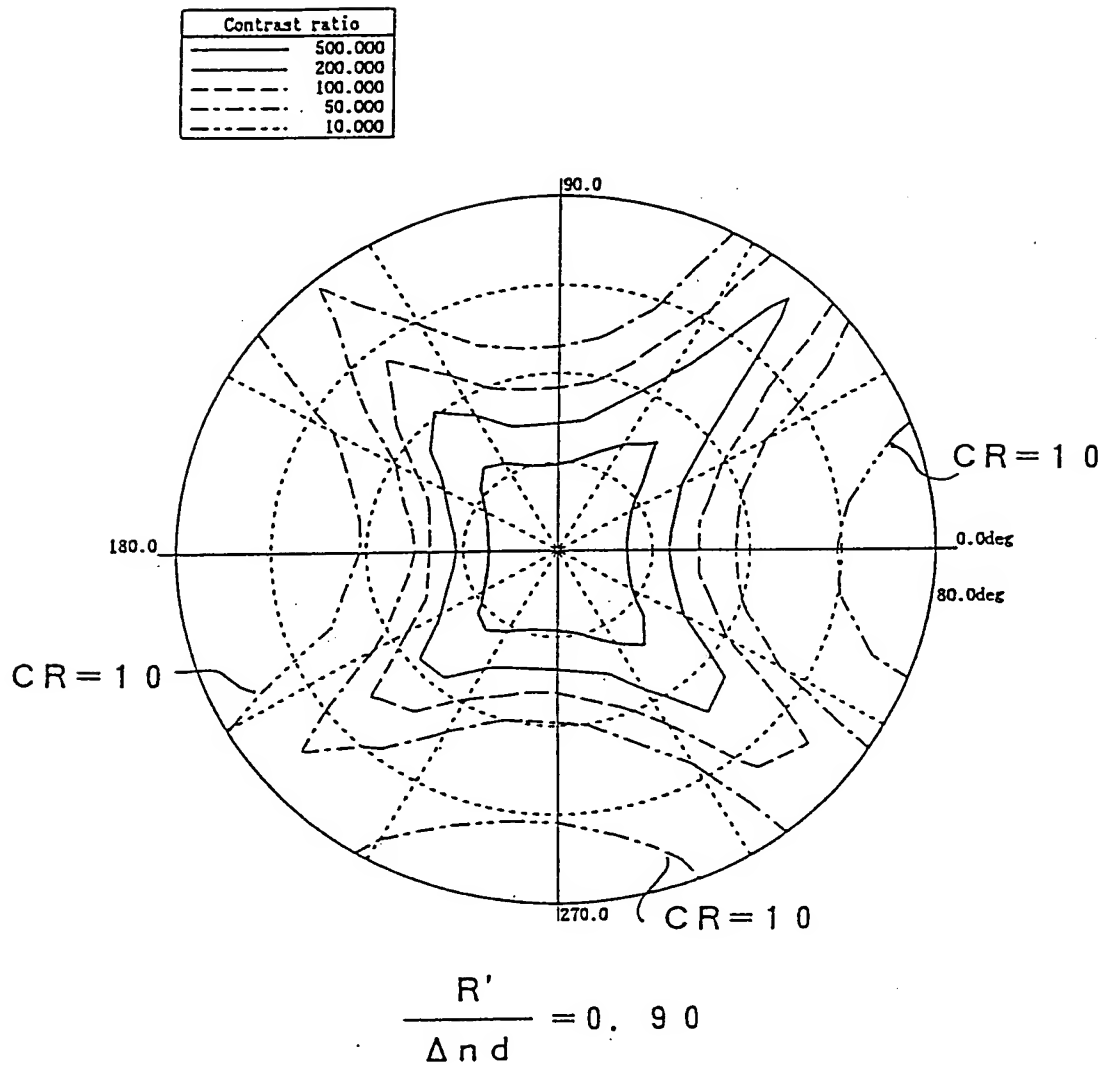
9  
 FIG. 7



10  
 FIG. 8

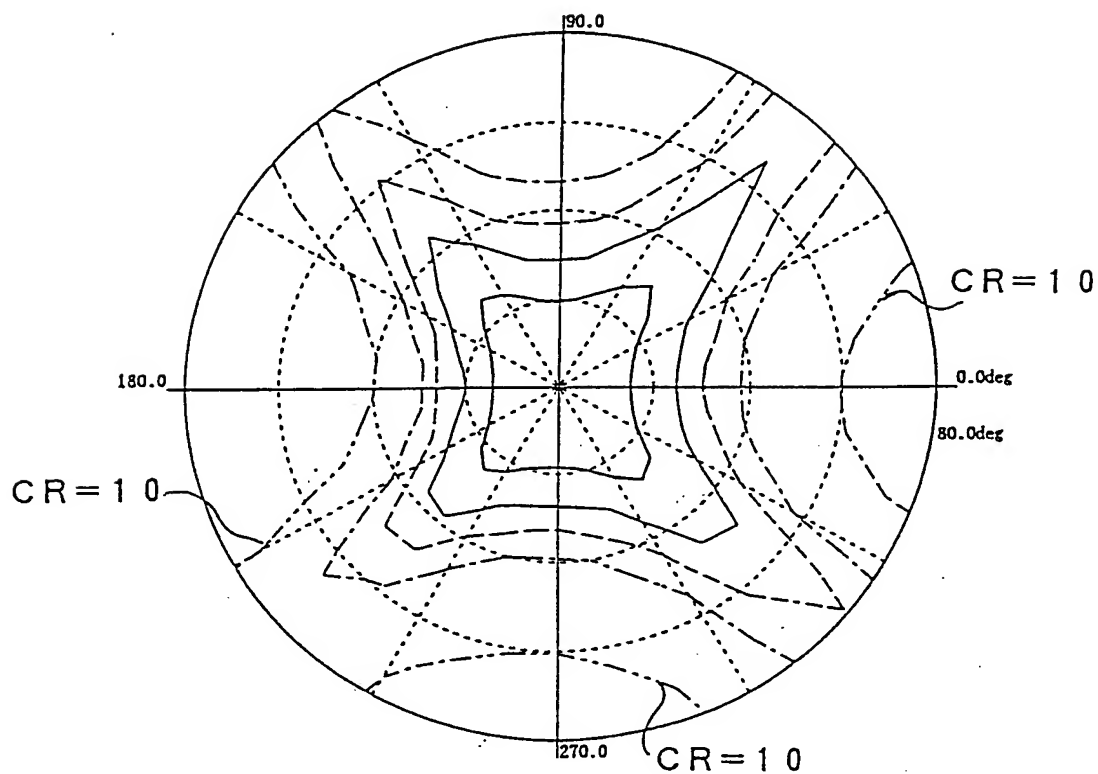


11  
 FIG. 9



12  
 FIG. 10

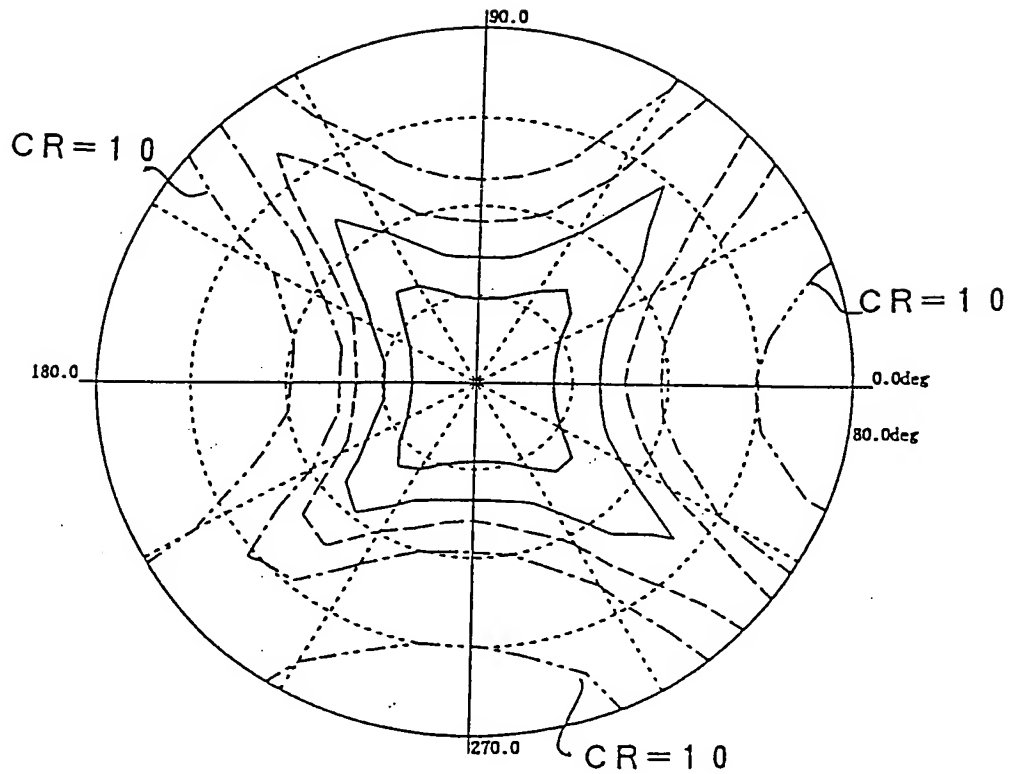
Contrast ratio	
—————	500.000
—————	200.000
-----	100.000
-----	50.000
-----	10.000



$$\frac{R'}{\Delta n d} = 0.97$$

13  
 FIG. 11

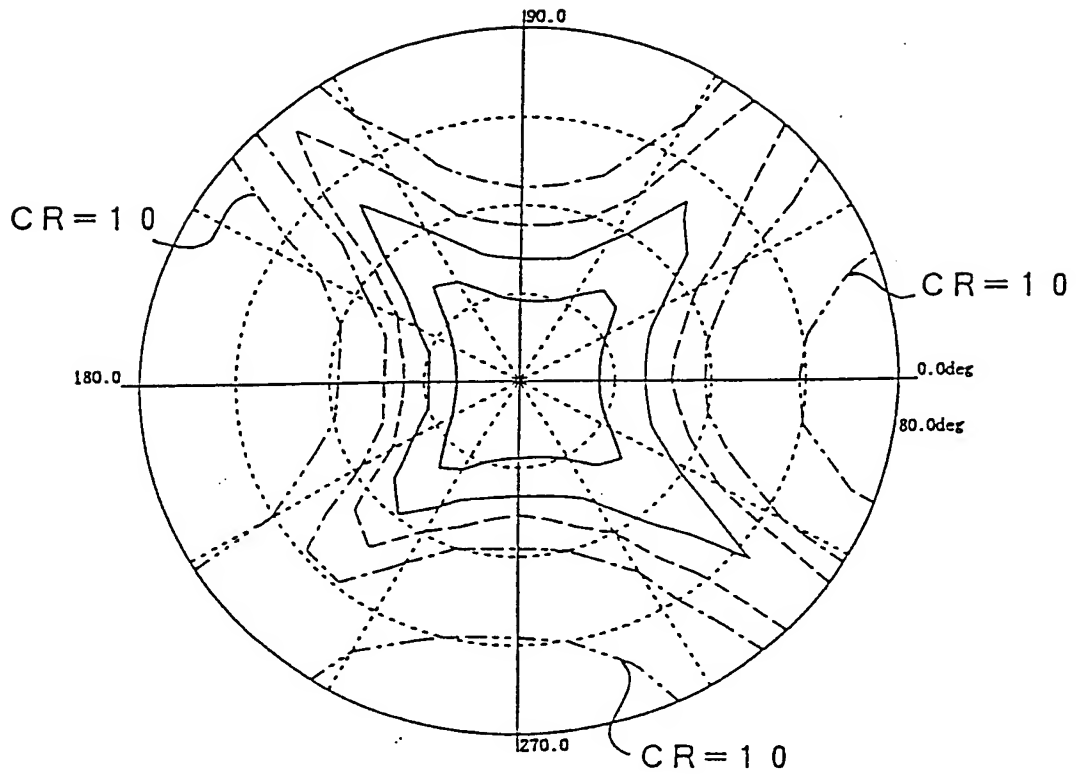
Contrast ratio	
—————	500.000
—————	200.000
-----	100.000
-----	50.000
-----	10.000



$$\frac{R'}{\Delta n d} = 1.05$$

14  
 FIG. 12

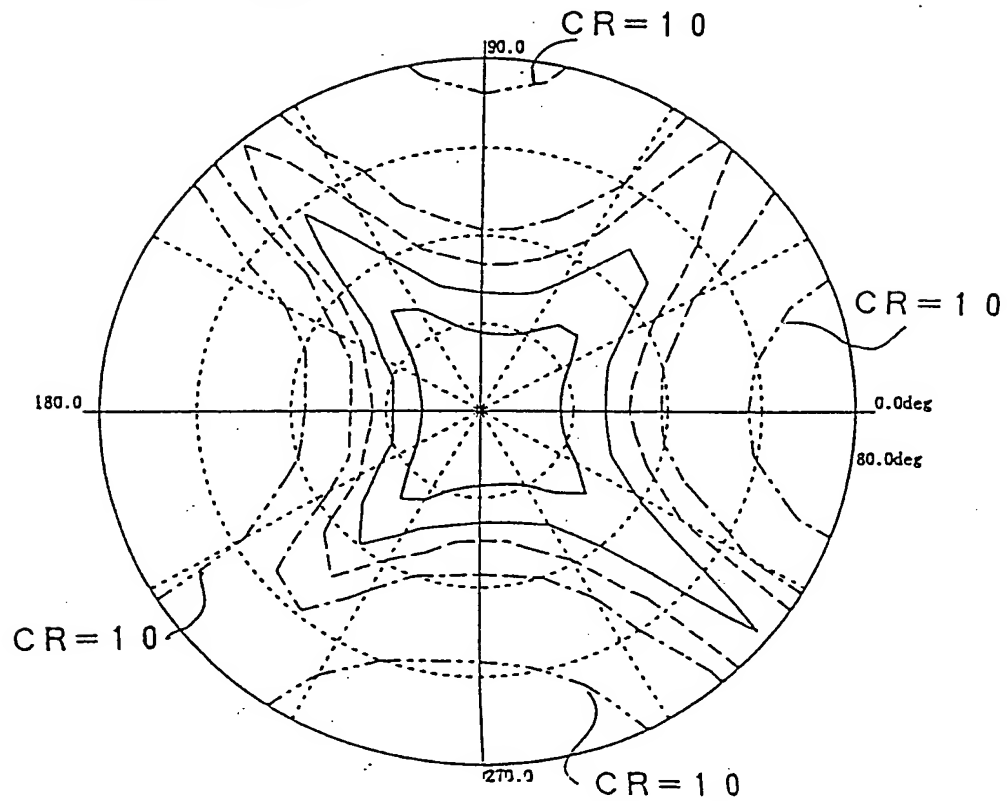
Contrast ratio	
—————	500.000
—————	200.000
-----	100.000
-----	50.000
-----	10.000



$$\frac{R'}{\Delta n d} = 1.12$$

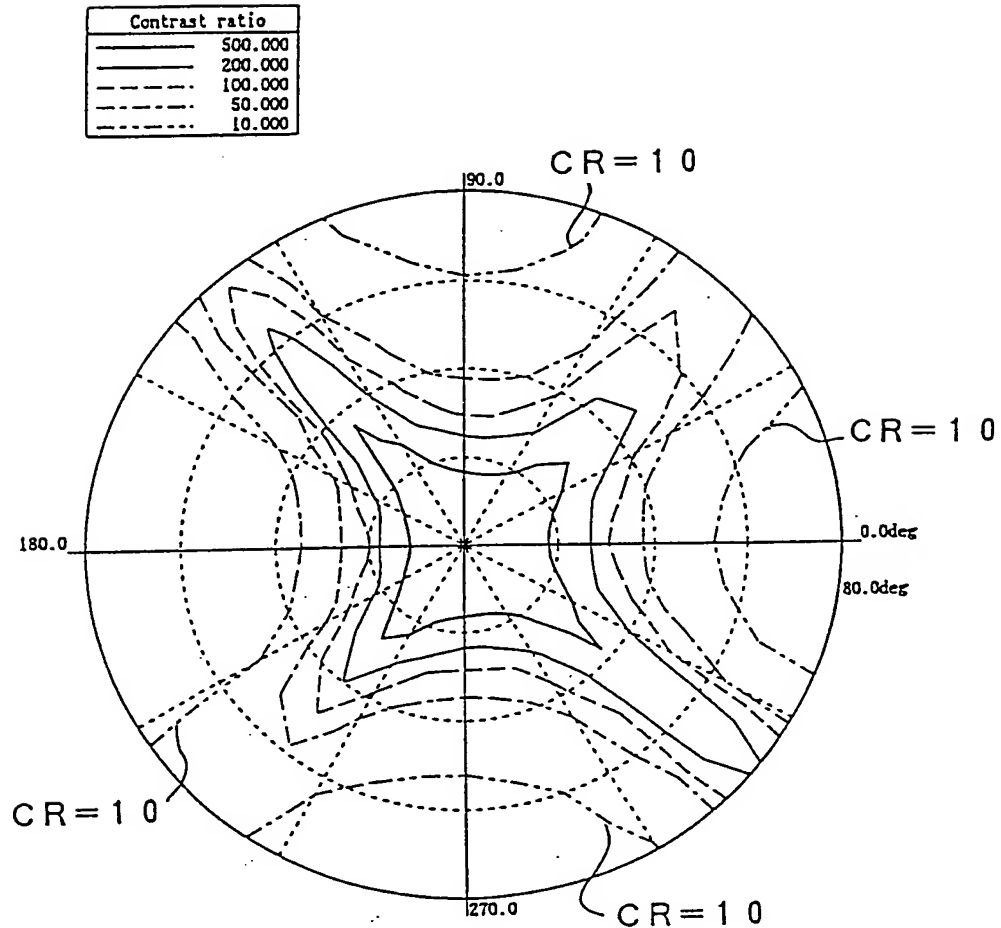
15  
 FIG. 13

Contrast ratio	
—————	500.000
—————	200.000
—————	100.000
—————	50.000
—————	10.000



$$\frac{R'}{\Delta n d} = 1.20$$

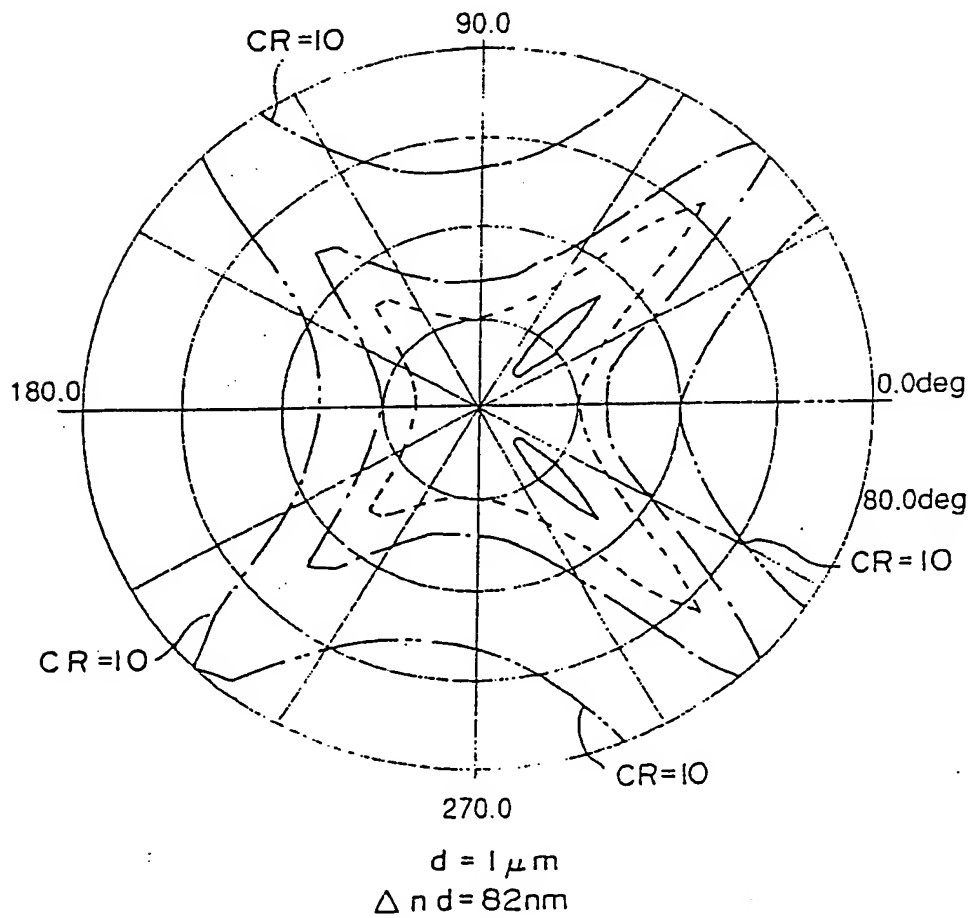
16  
 FIG. 14




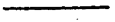



$$\frac{R'}{\Delta n d} = 1.34$$

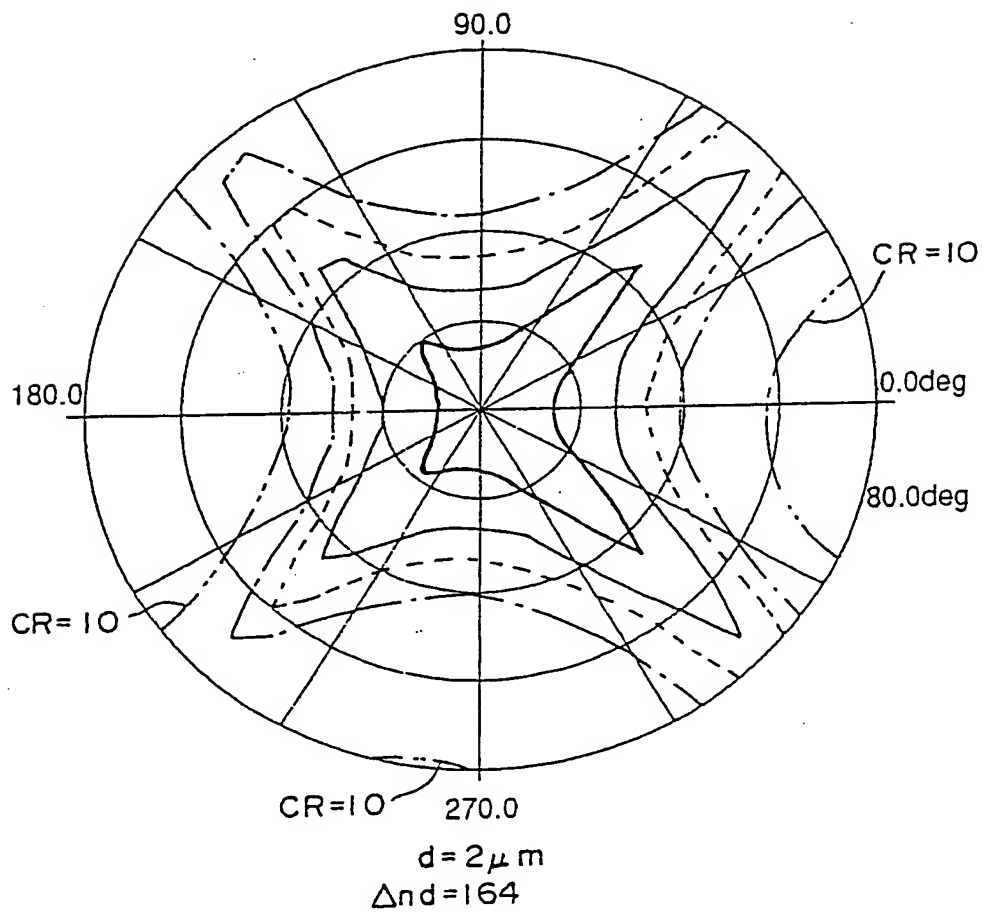
17  
 FIG. 15

Contrast ratio	
————	500.000
————	200.000
- - - -	100.000
- · - ·	50.000
- · - ·	10.000



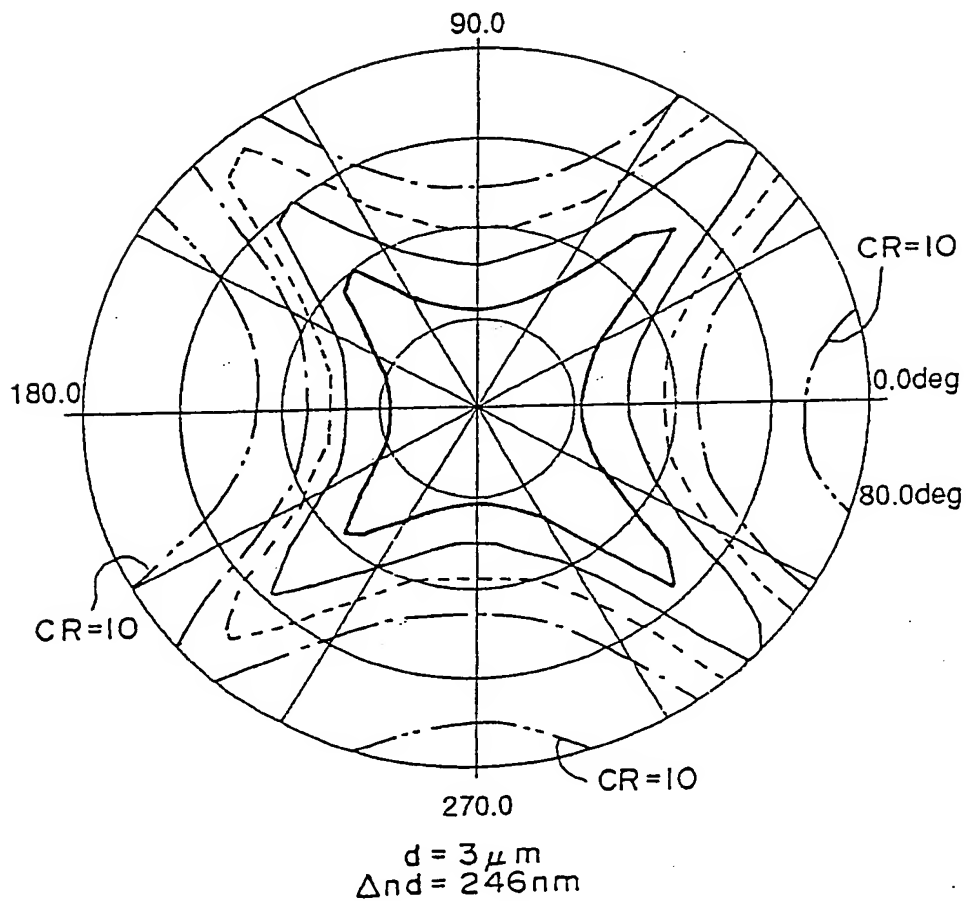
18  
 FIG. 16

Contrast ratio	
	500.000
	200.000
	100.000
	50.000
	10.000



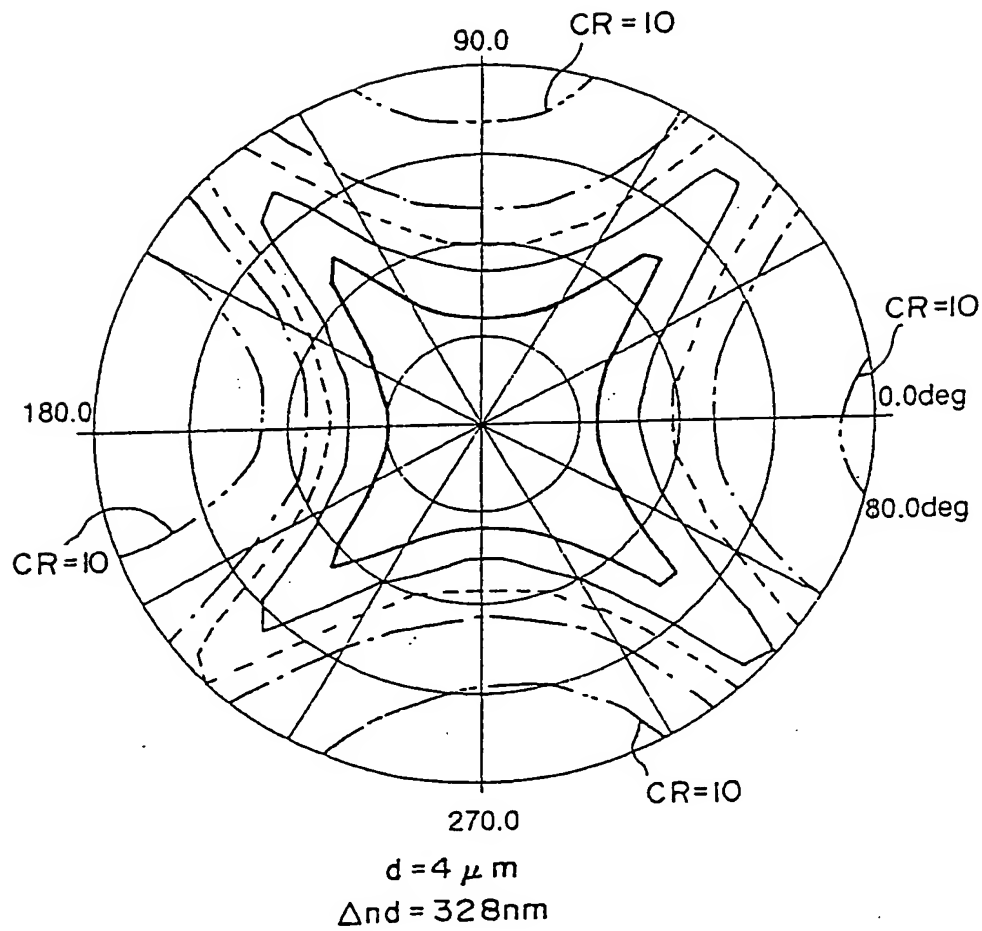
19  
 FIG. 17

Contrast ratio	
————	500.000
————	200.000
-----	100.000
-----	50.000
-----	10.000

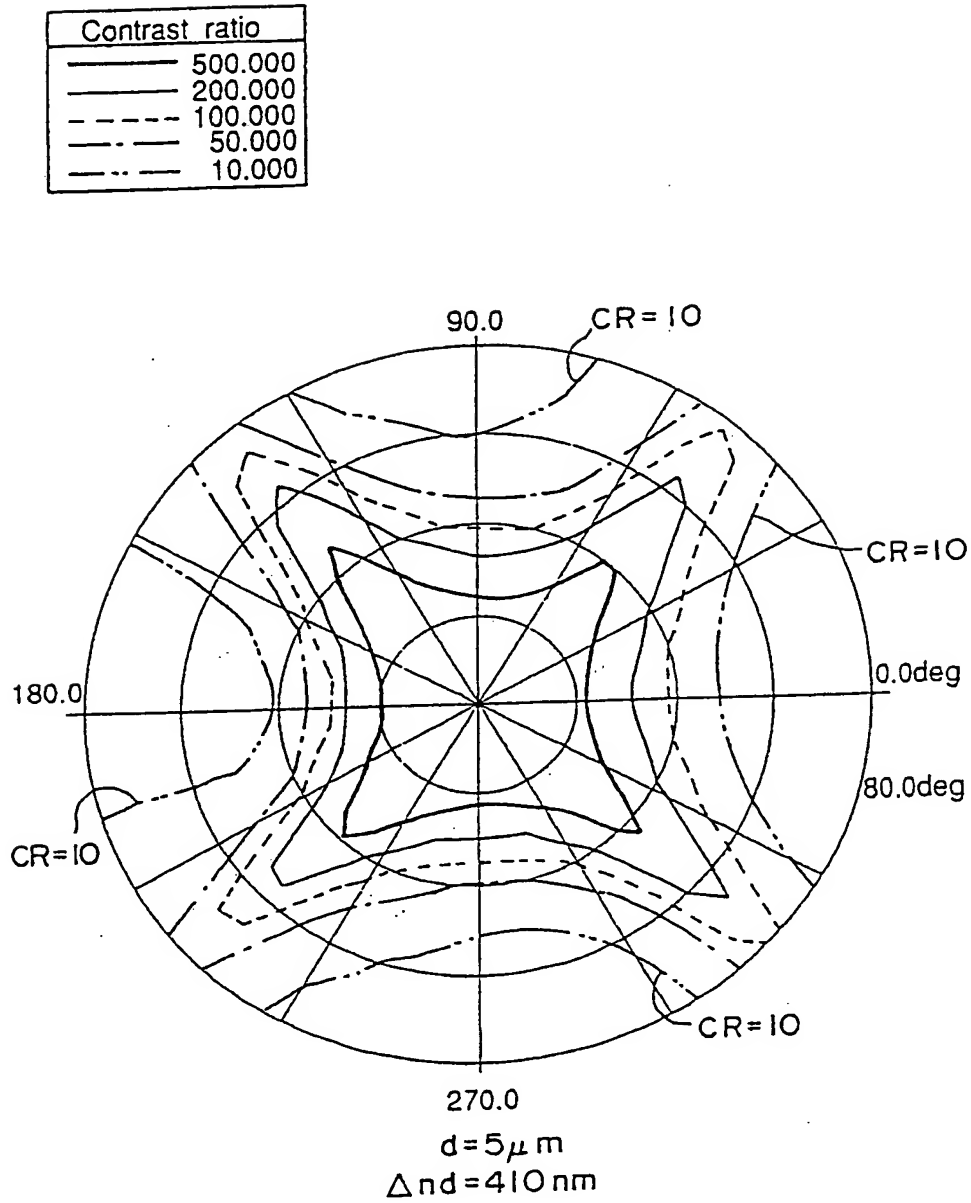


20  
FIG. 18

Contrast ratio	
————	500.000
————	200.000
-----	100.000
-----	50.000
-----	10.000



21  
 FIG. 19



22  
FIG. 20

Contrast ratio	
————	500.000
————	200.000
-----	100.000
- - - - -	50.000
- - - - -	10.000

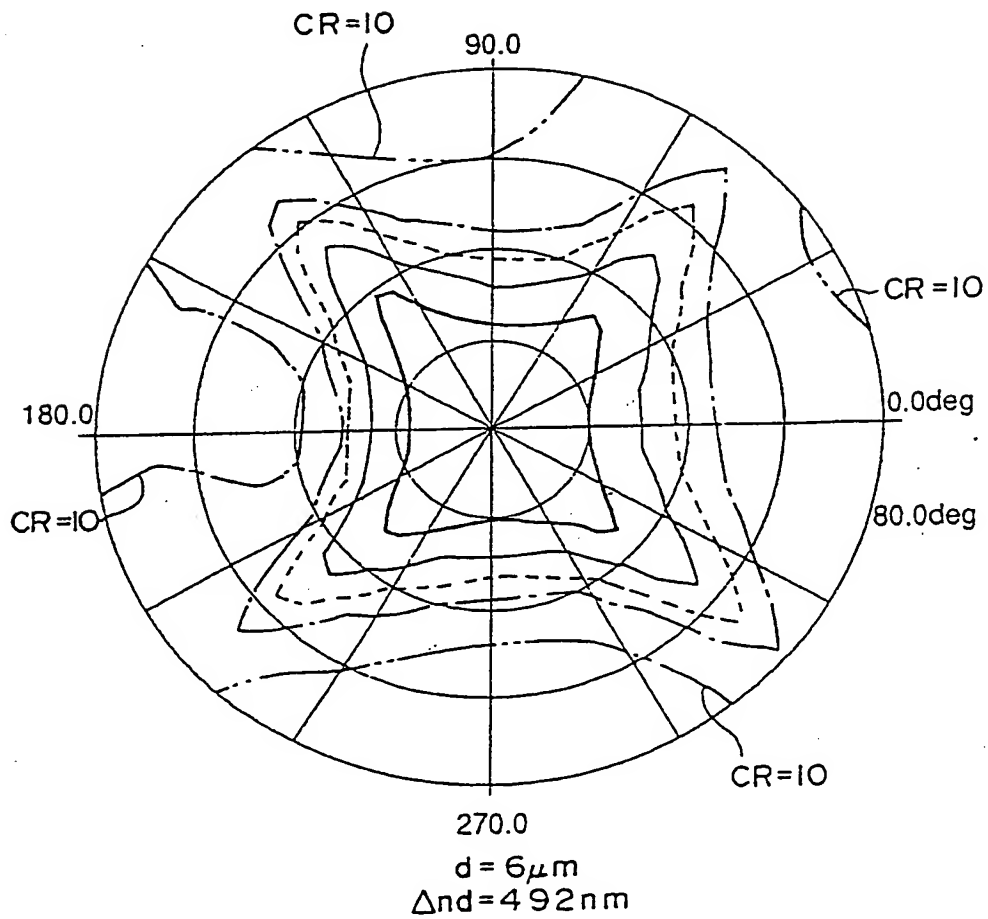
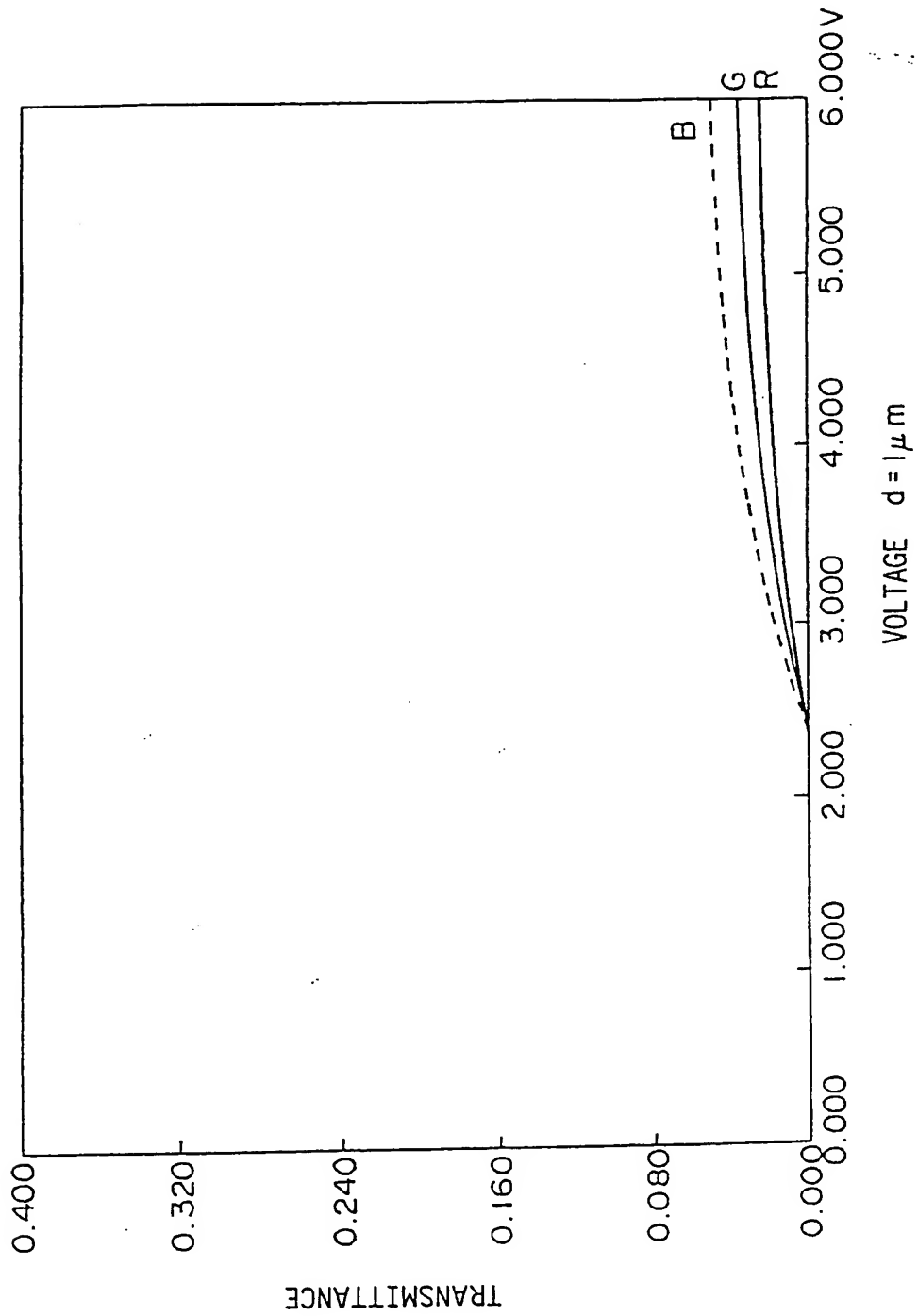
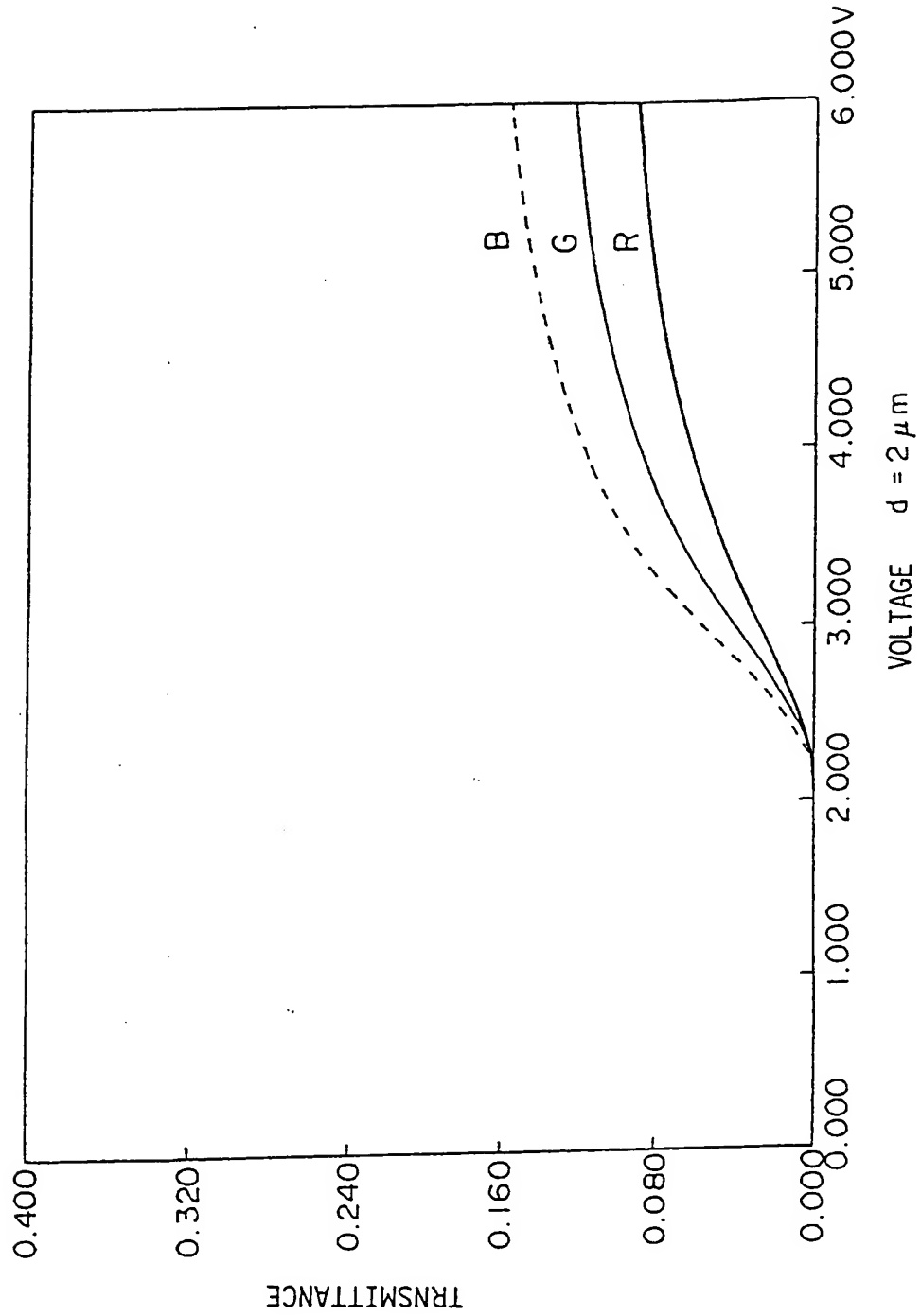


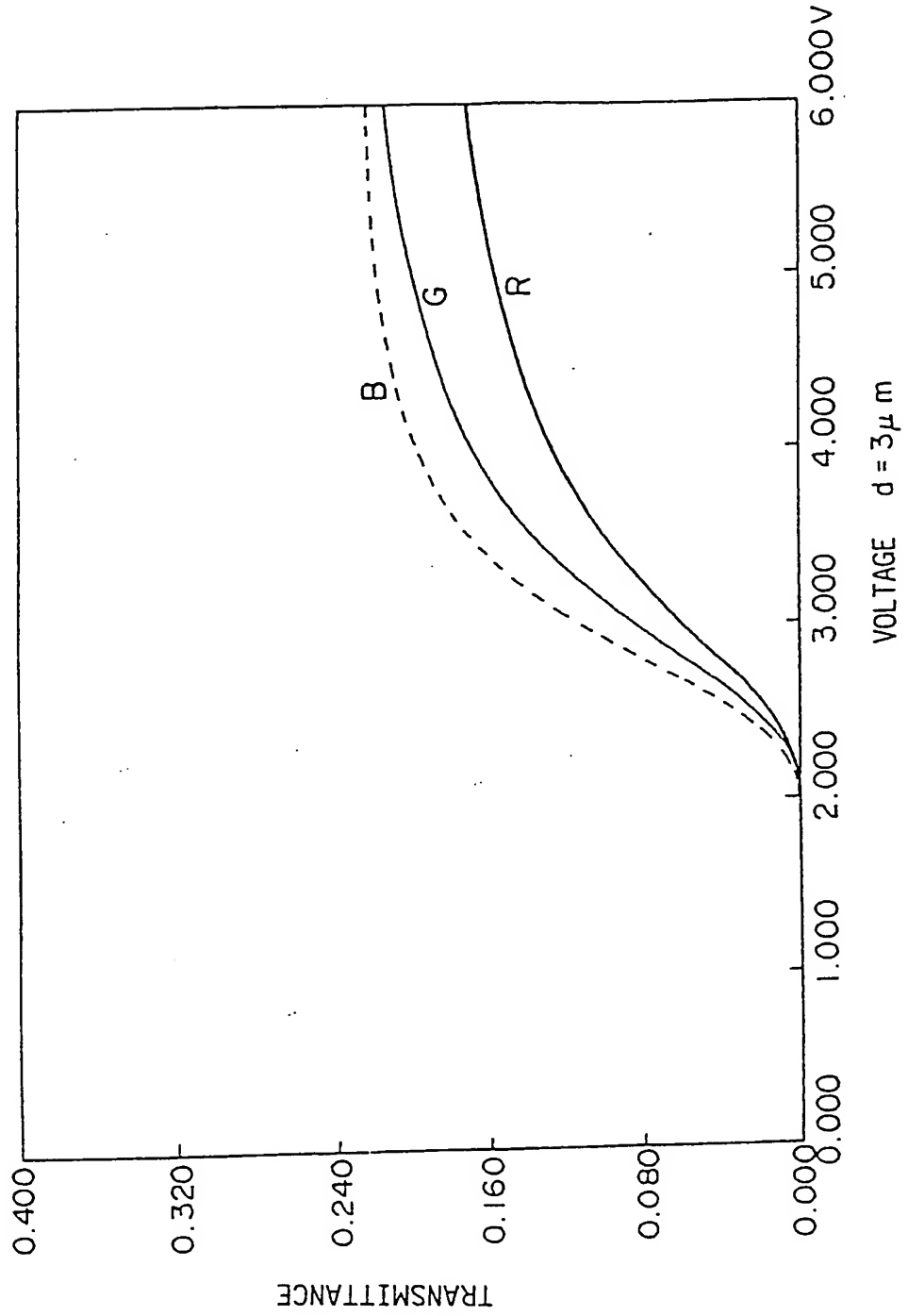
FIG. 21<sup>23</sup>



24  
FIG. 22

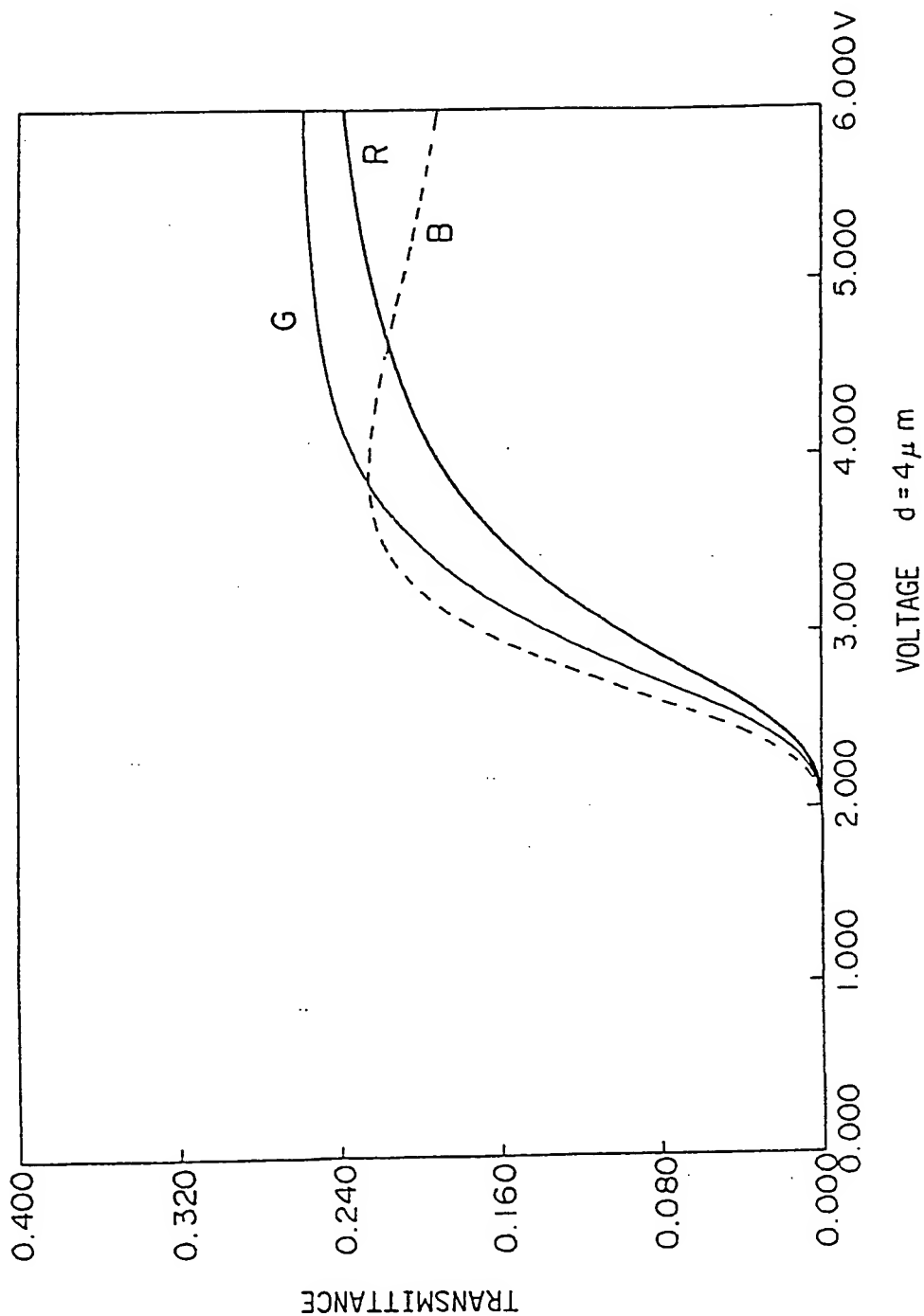


25  
FIG. 23

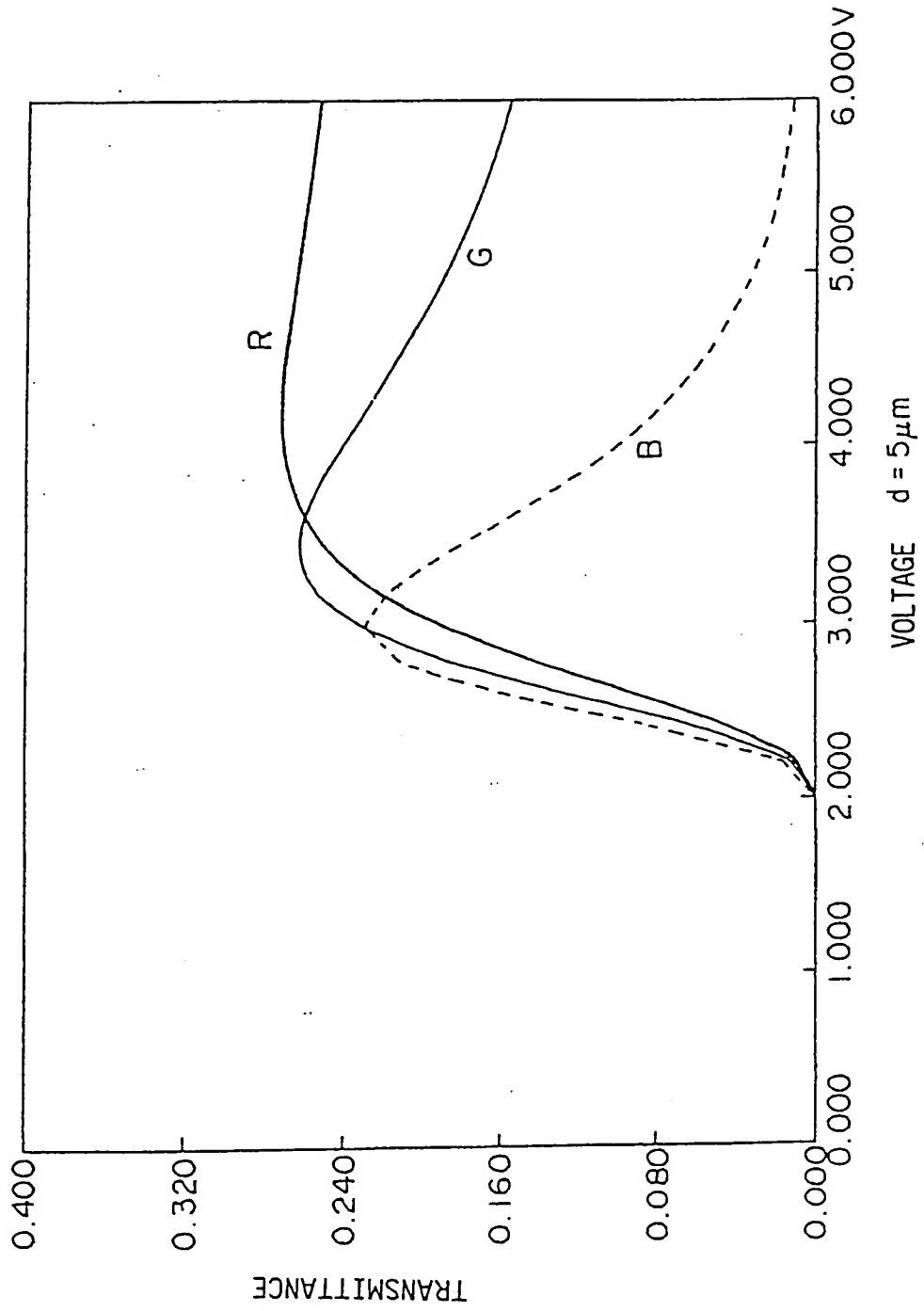


26

FIG. 24

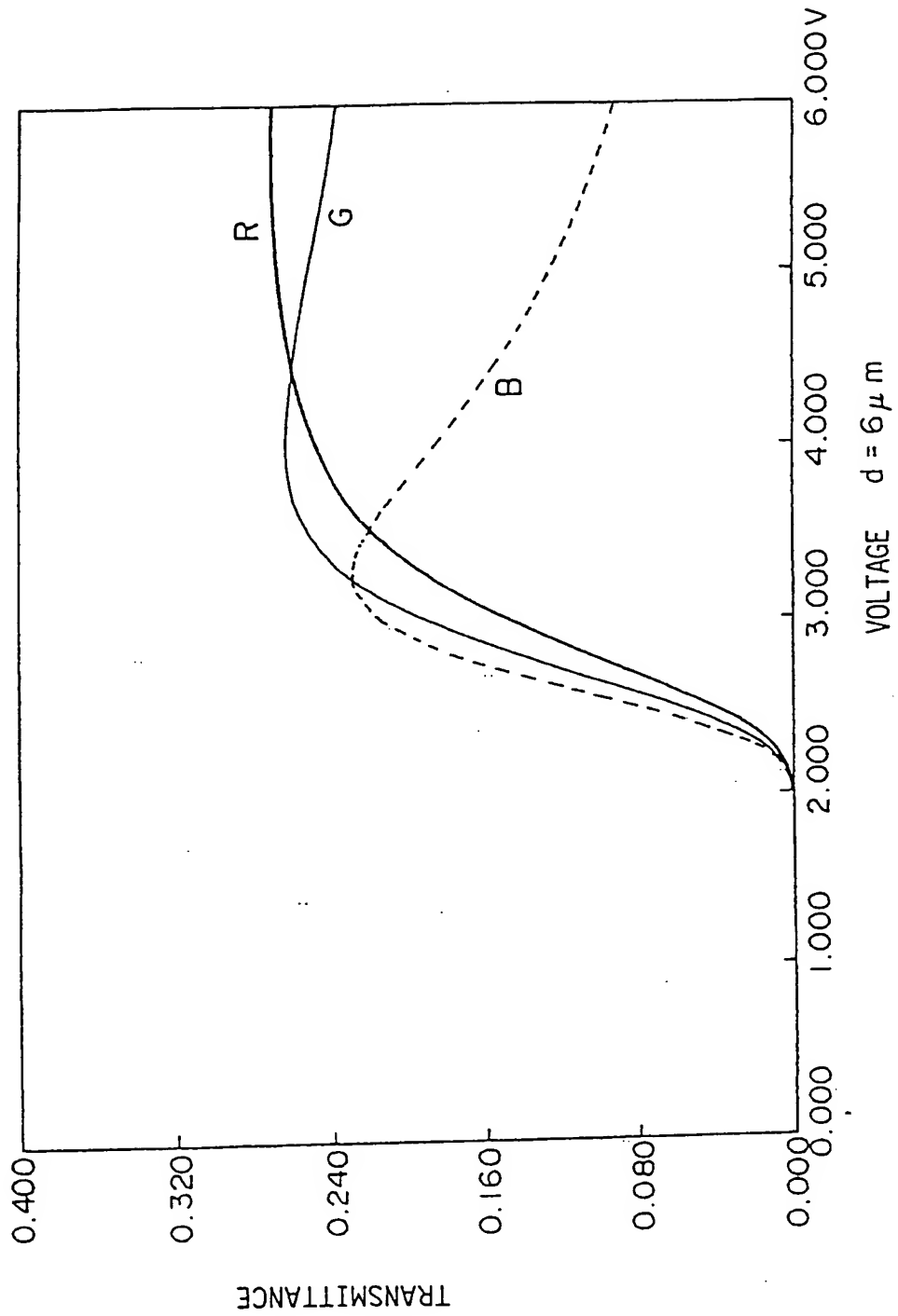


27  
FIG. 25

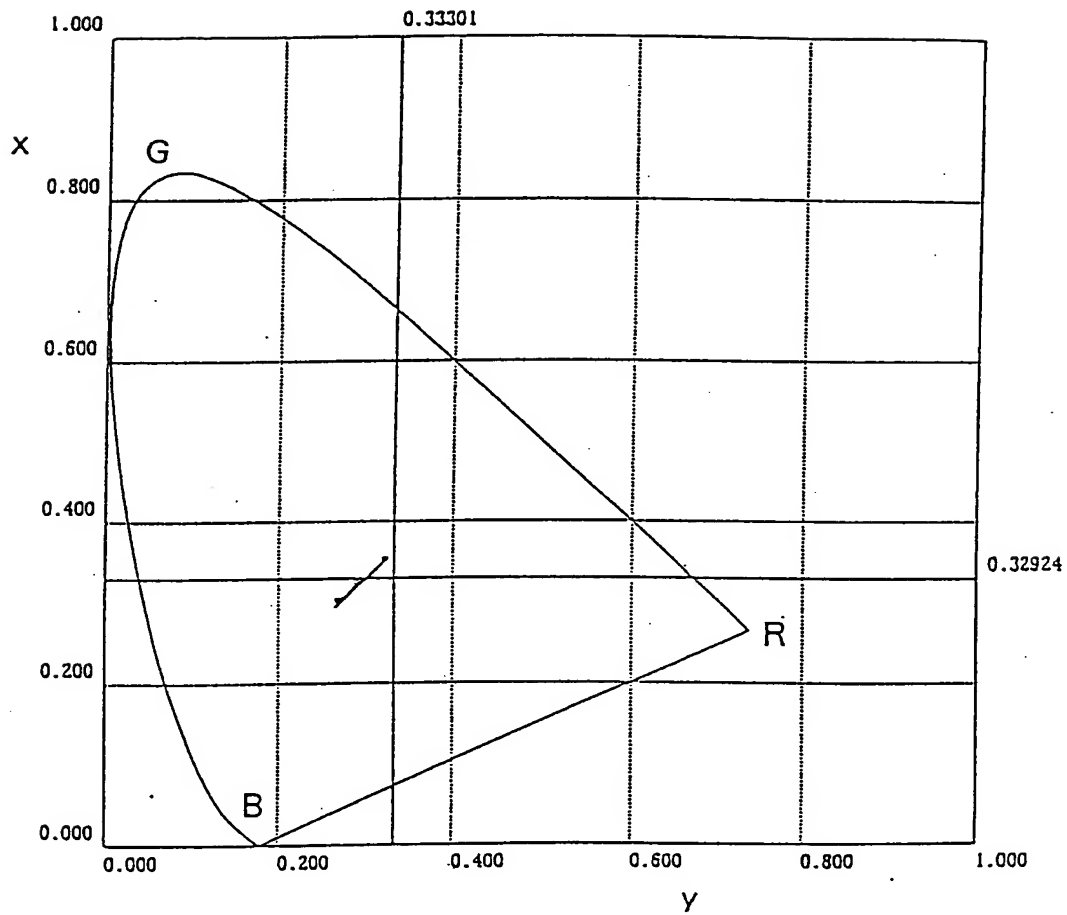


28

FIG. 26

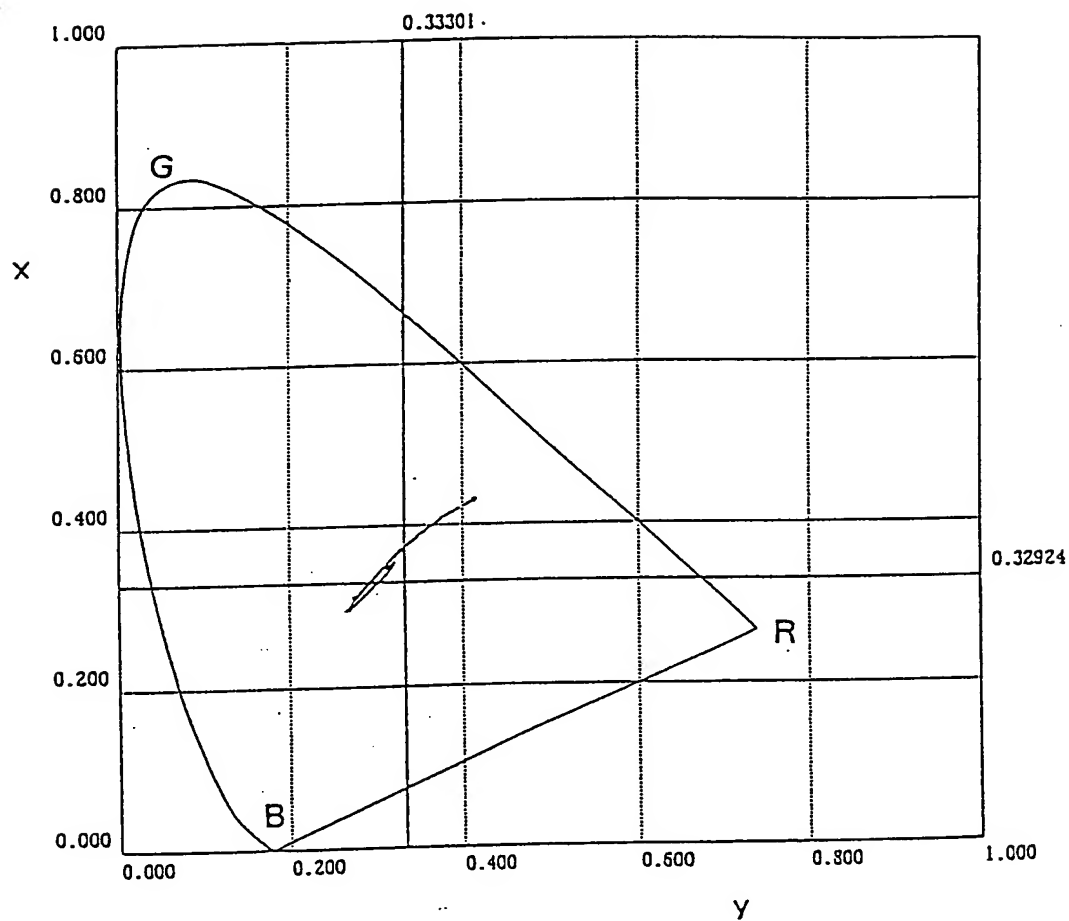


29  
FIG. 27



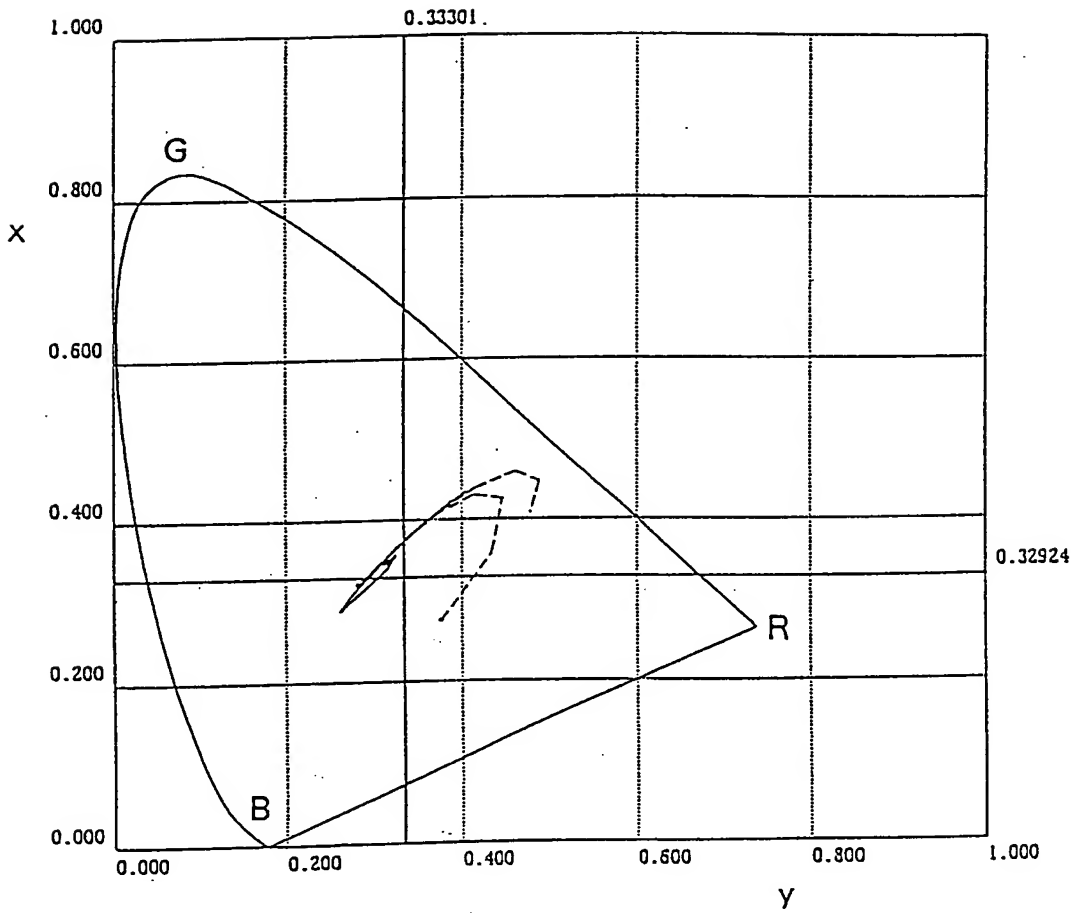
$$d = 1 \mu m$$

30  
FIG. 28



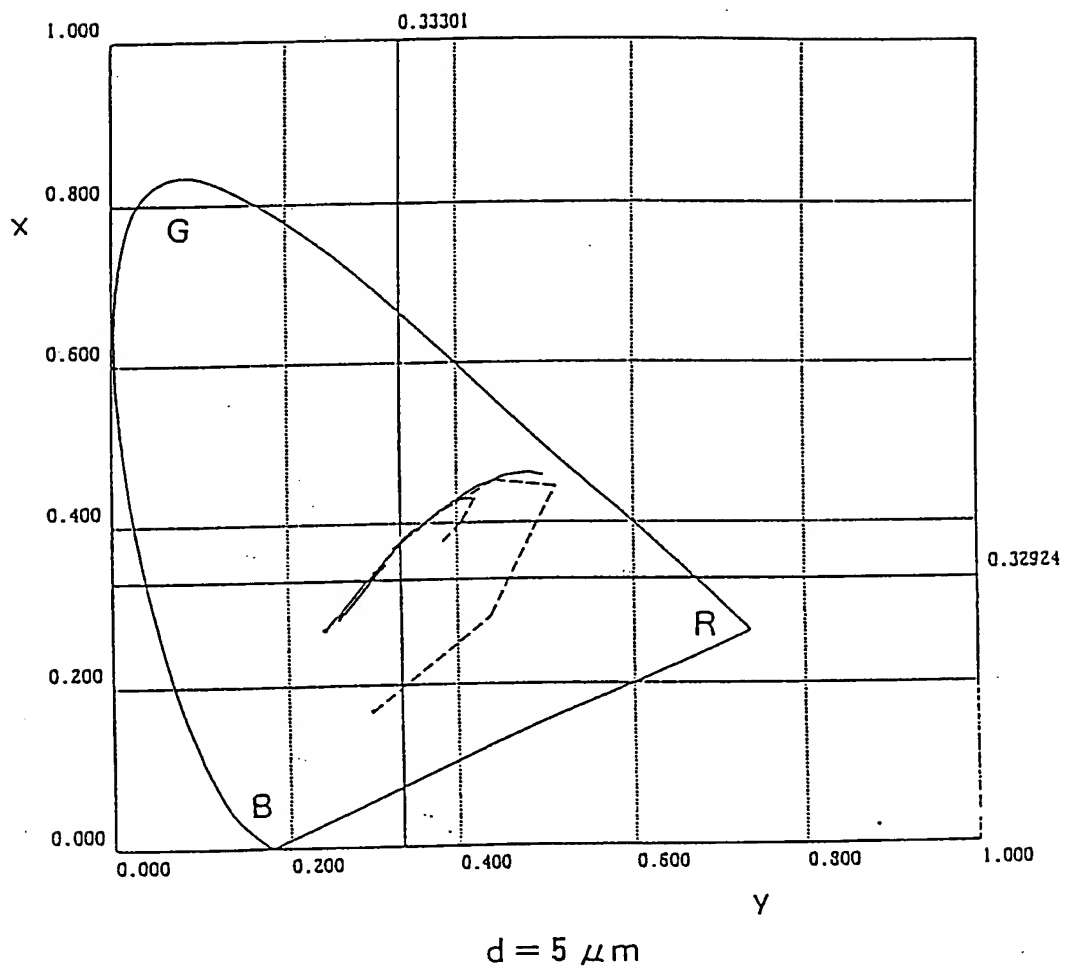
$d = 3 \mu\text{m}$

3/  
FIG. 29

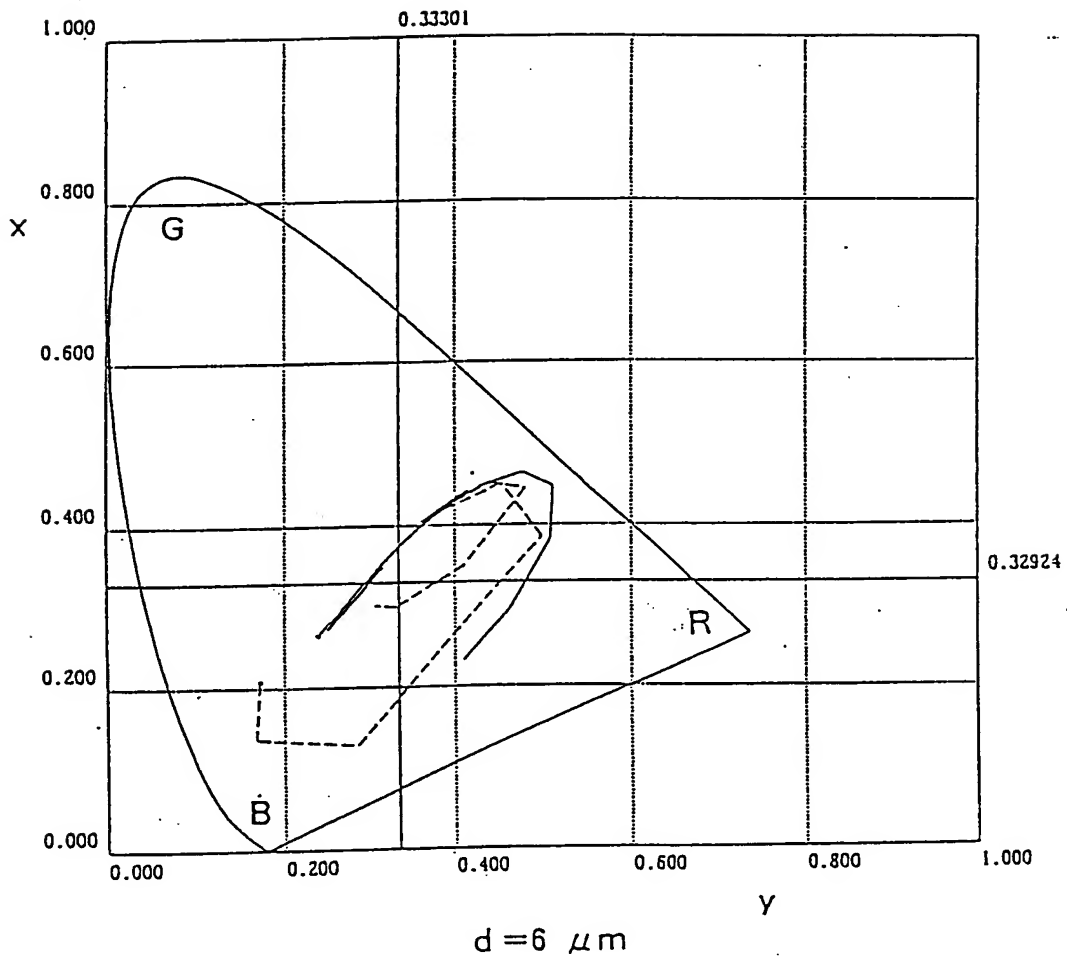


$$d = 4 \mu m$$

32  
FIG. 30

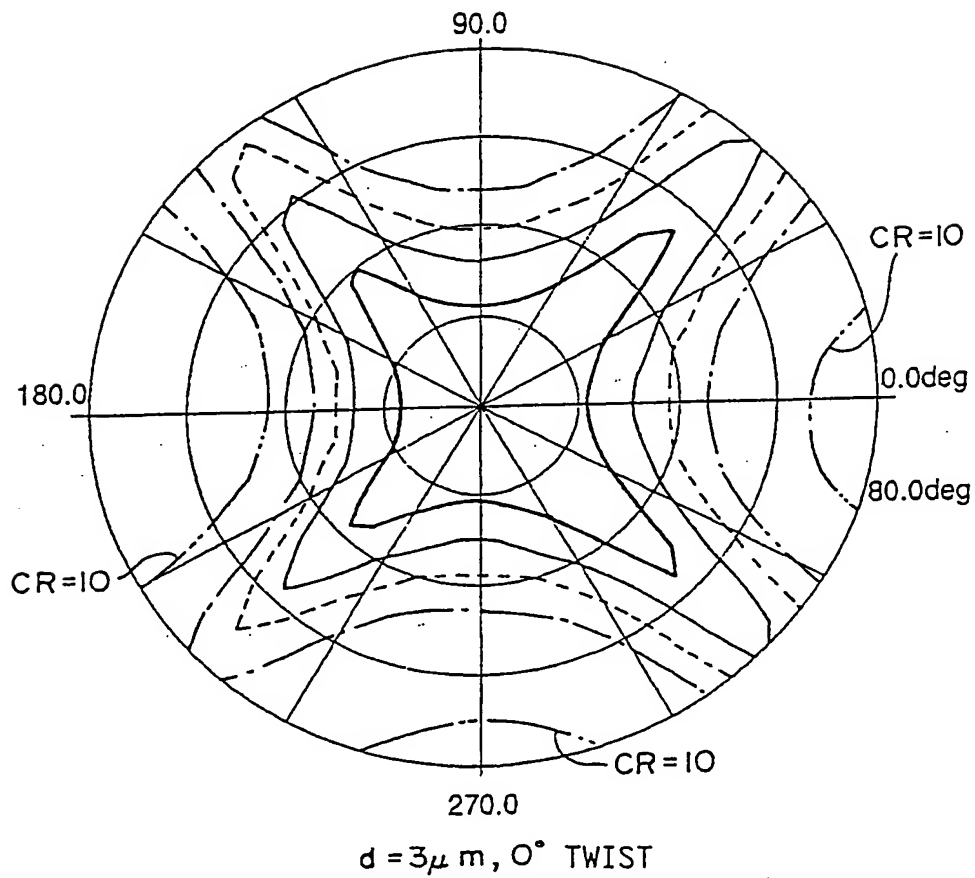


33  
FIG. 31

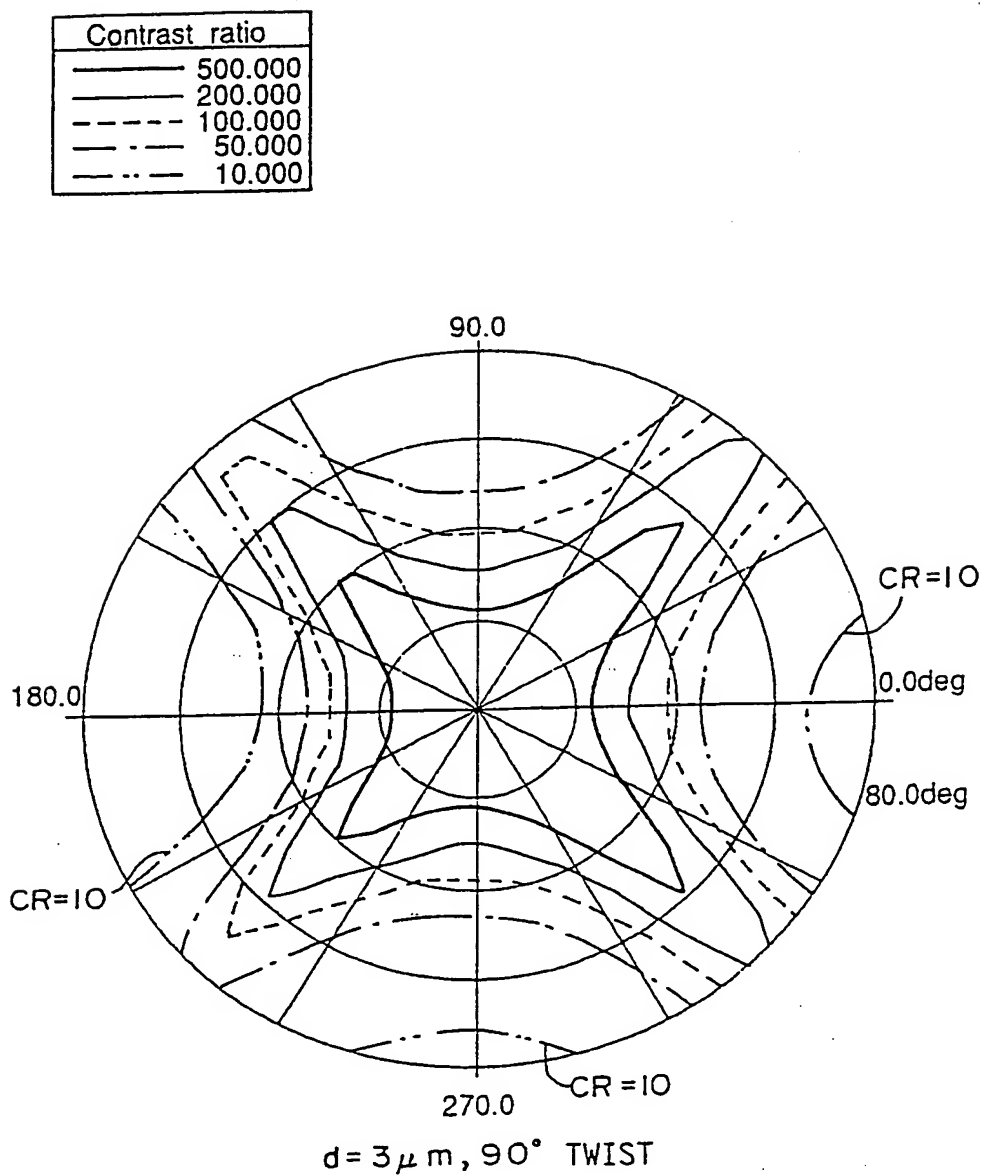


34  
FIG. 32

Contrast ratio	
————	500.000
————	200.000
-----	100.000
- - - - -	50.000
- . . . .	10.000

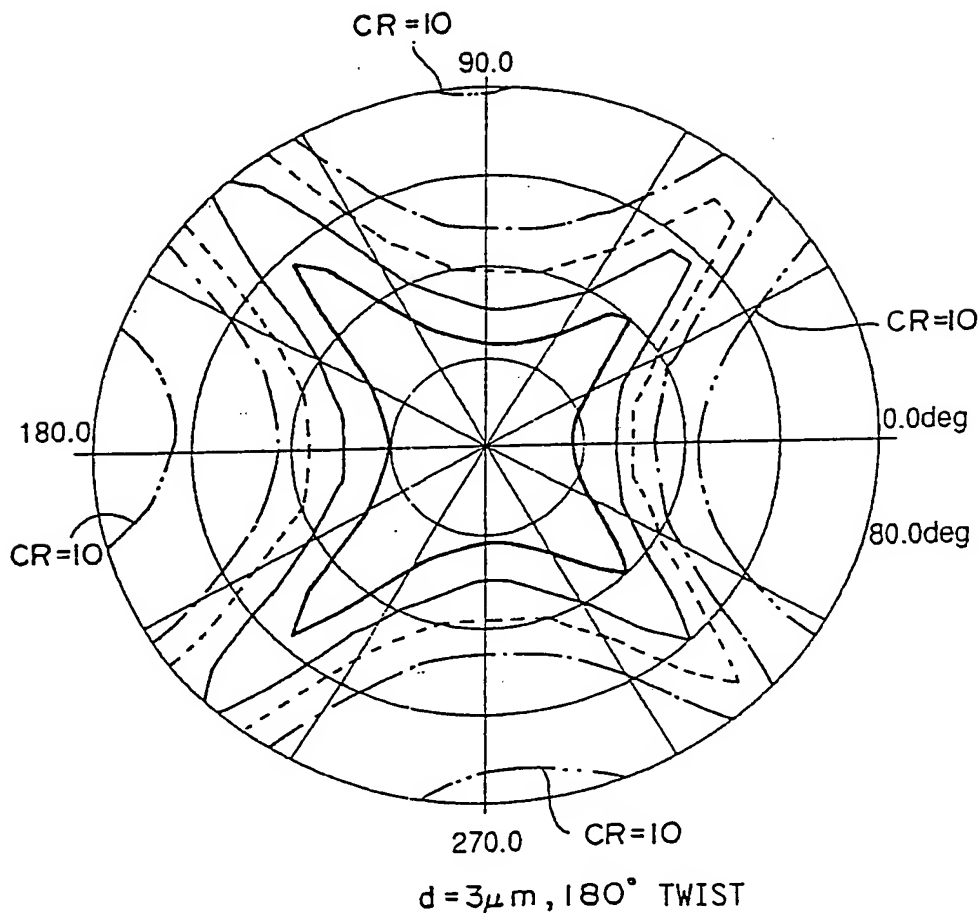


35  
FIG. 33



36  
 FIG. 34

Contrast ratio	
————	500.000
————	200.000
-----	100.000
- - - - -	50.000
· · · · ·	10.000



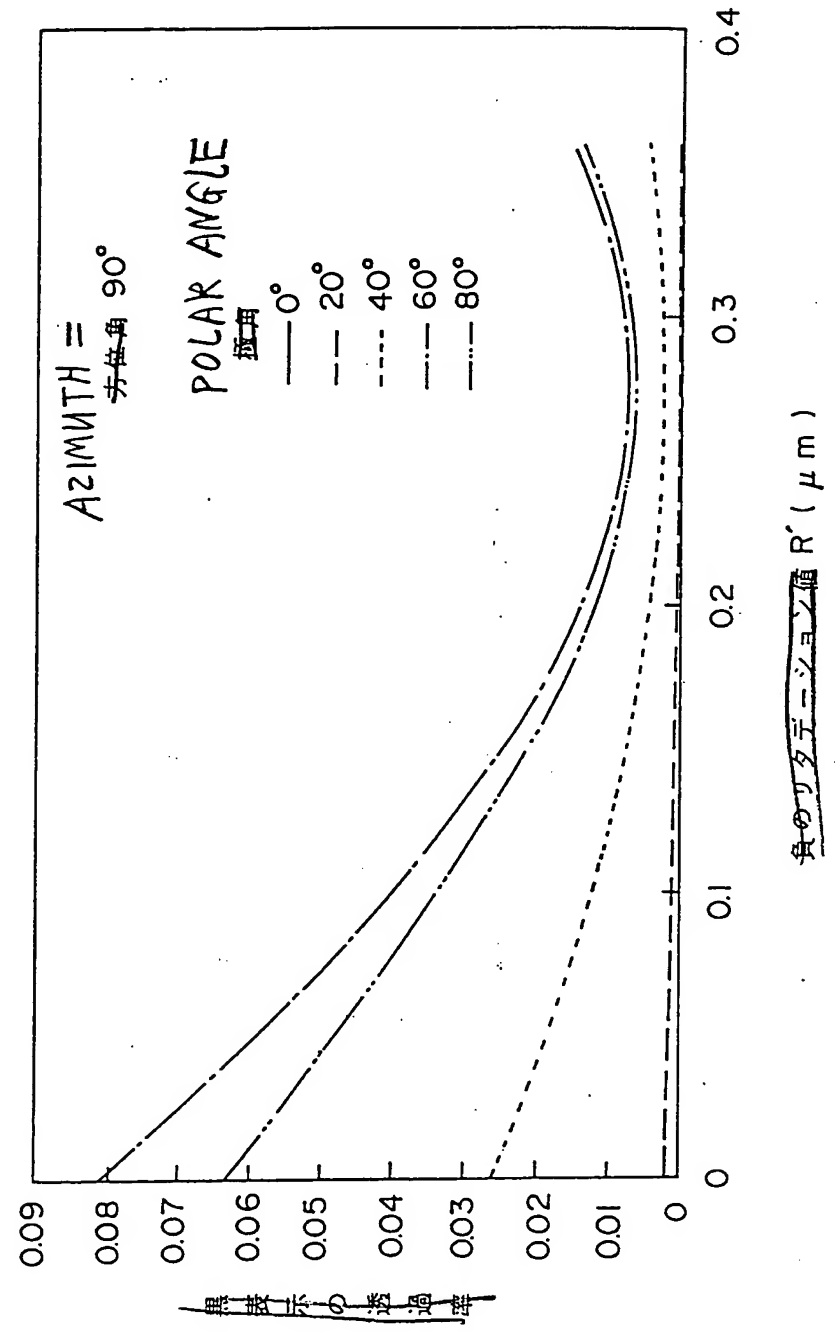
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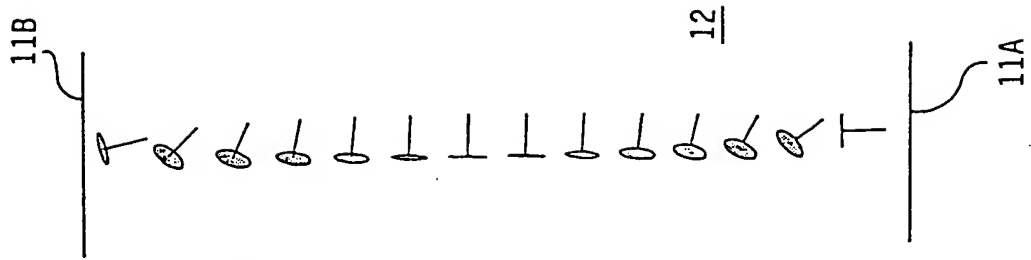
【図37】

図6の液晶表示装置の黒表示時における透過率を示す図

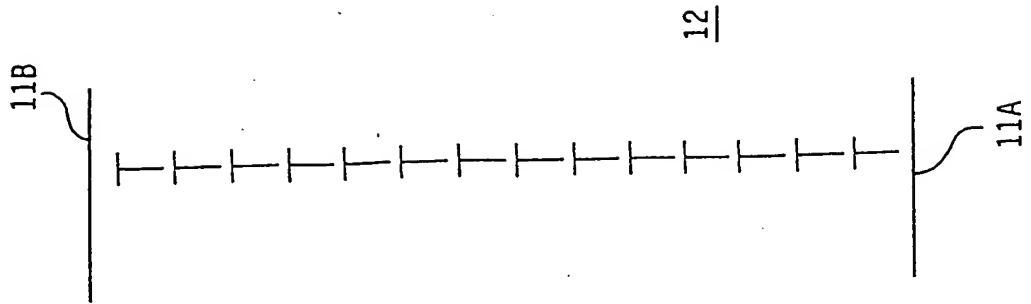
FIG 37

BLACK-MODE TRANSMITTANCE





38  
FIG. 38B



38  
FIG. 38A

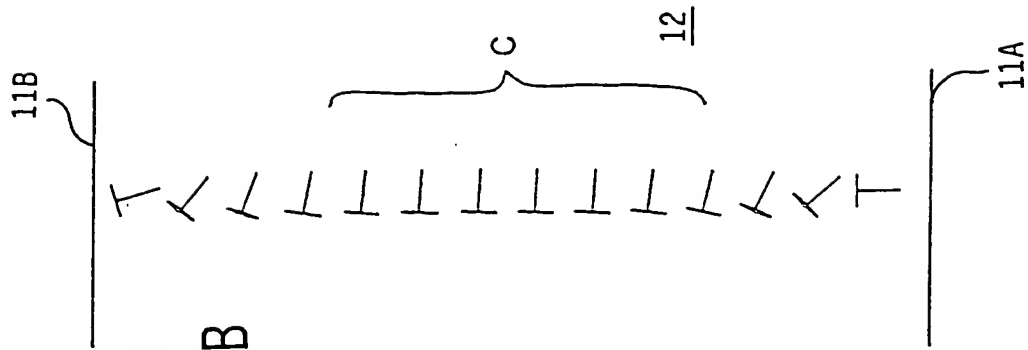


FIG. 36B

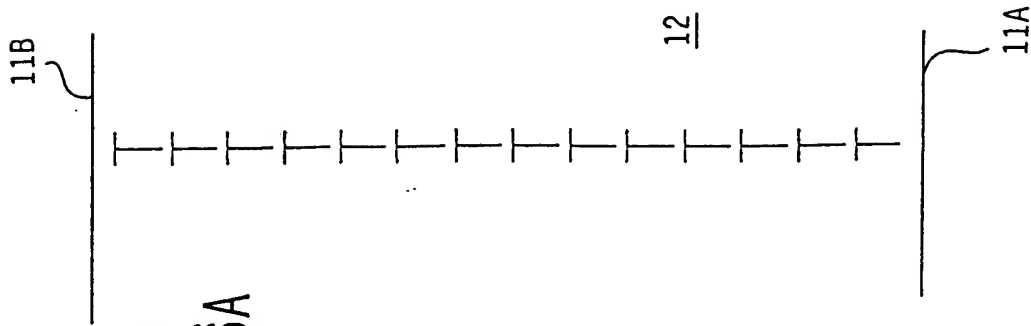
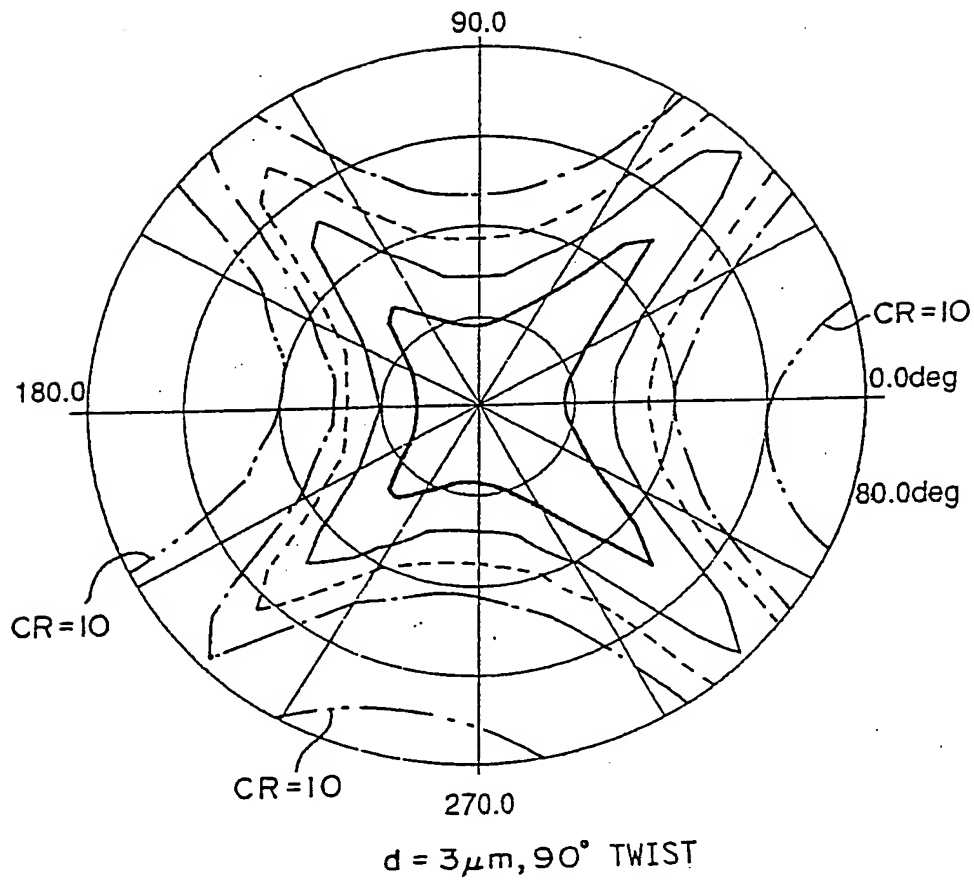


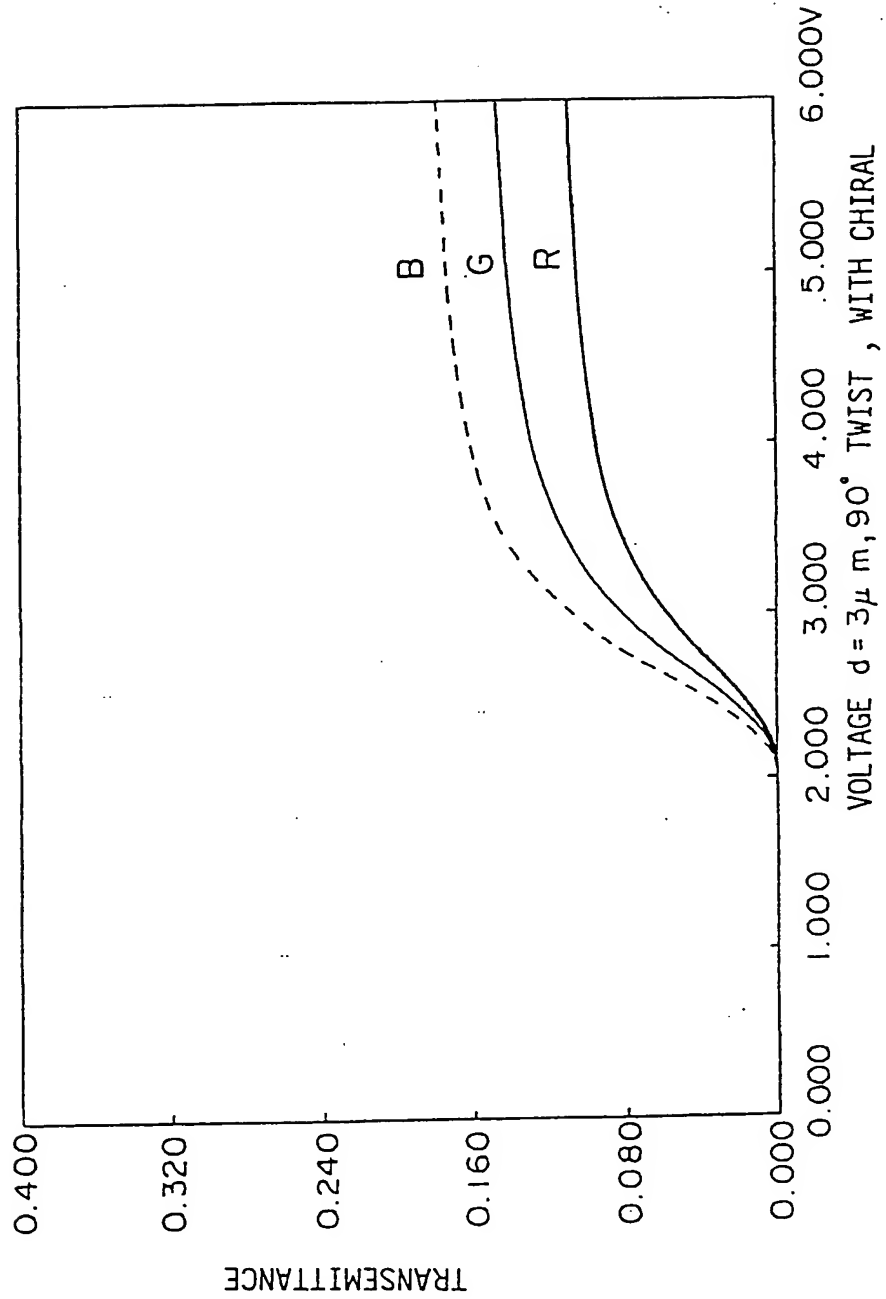
FIG. 36A

40  
 FIG. 37

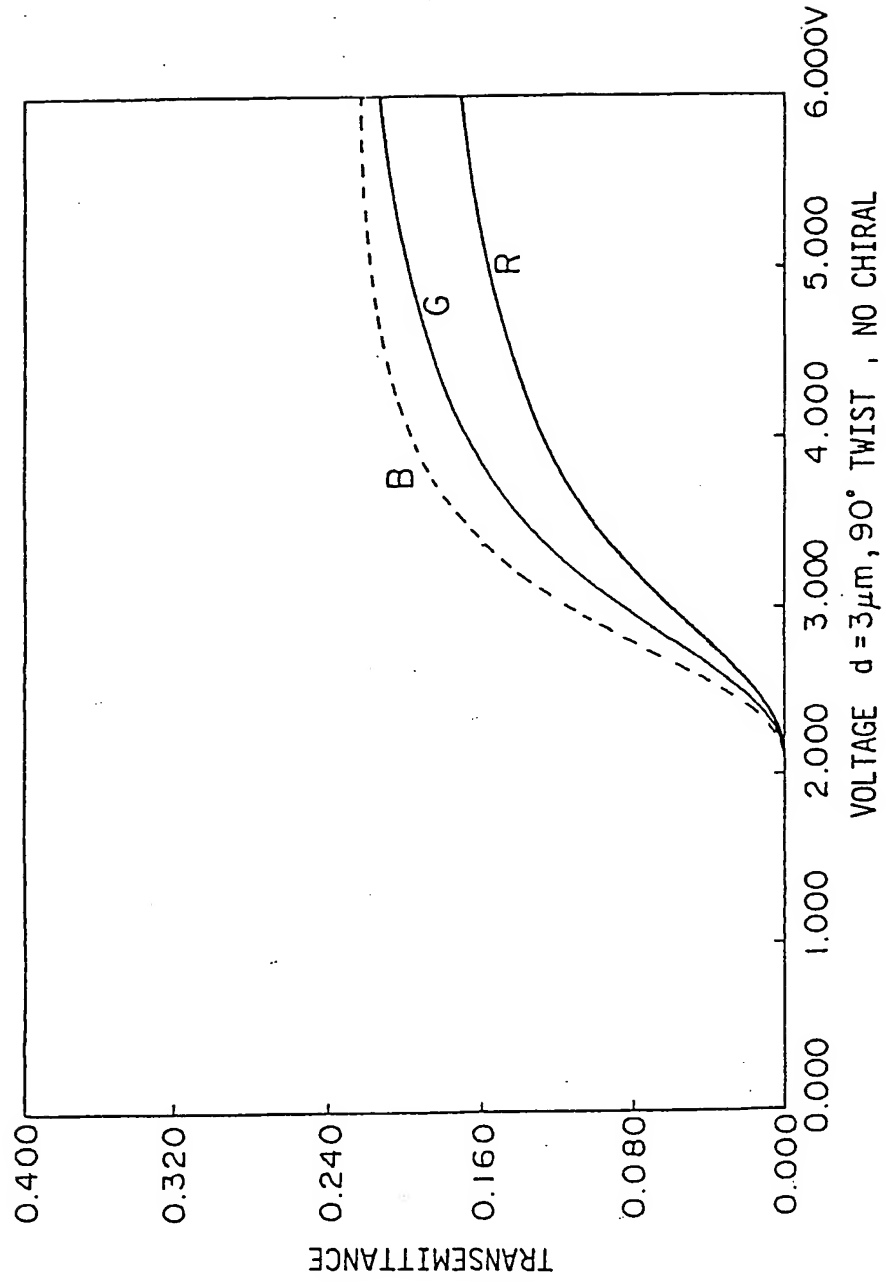
Contrast ratio	
————	500.000
————	200.000
-----	100.000
-----	50.000
-----	10.000



4/  
FIG. 38

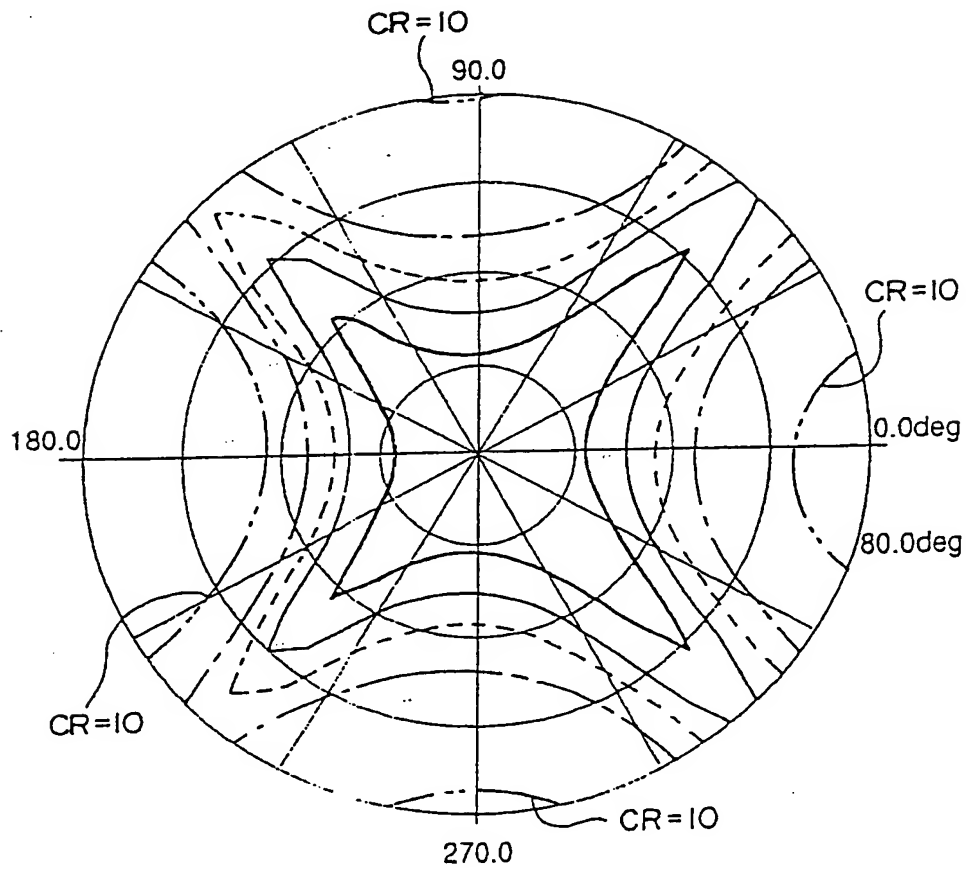


42  
FIG. 39



43  
FIG. 40

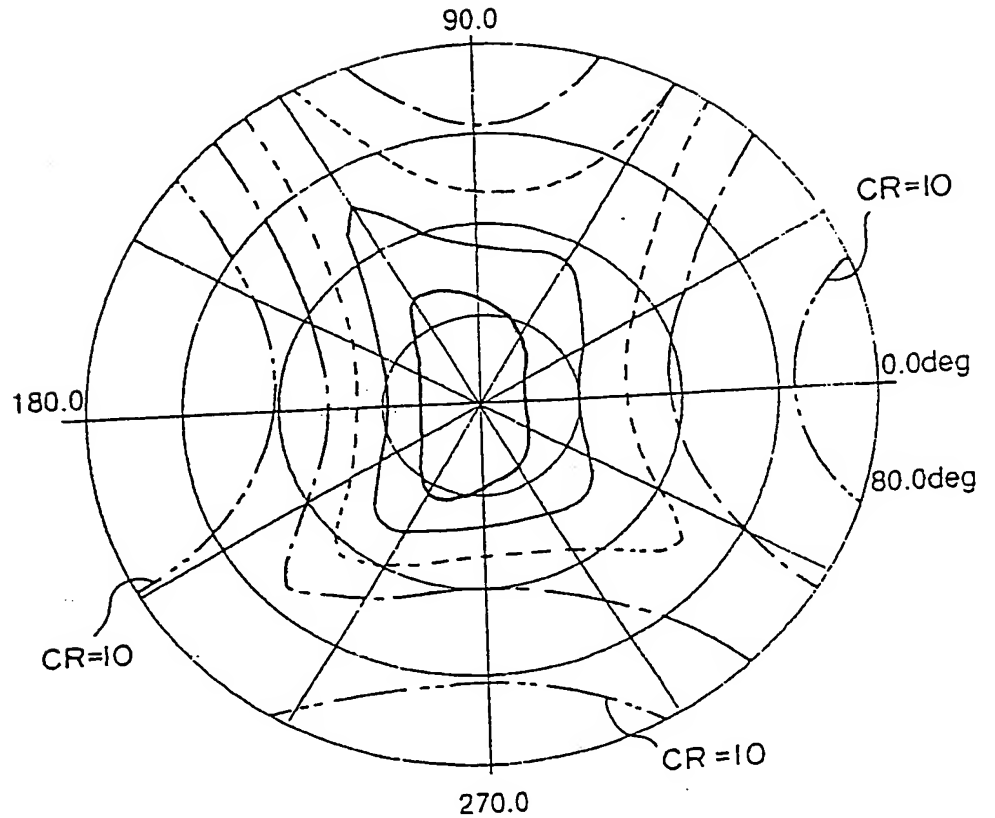
Contrast ratio	
————	500.000
————	200.000
-----	100.000
-----	50.000
-----	10.000



PRETILT= 89.99°  
CELL= 3μm, 45° TWIST

44  
FIG. 41

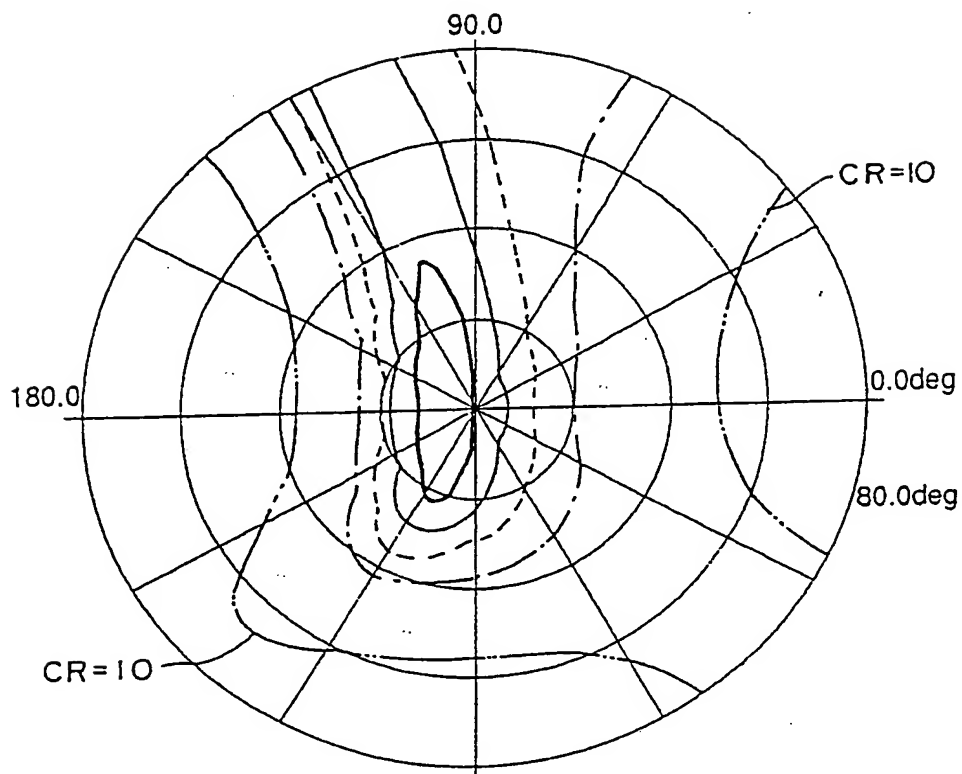
Contrast ratio	
————	500.000
————	200.000
-----	100.000
-----	50.000
-----	10.000



PRETILT = 85°  
CELL = 3μm, 45° TWIST

45  
FIG. 42

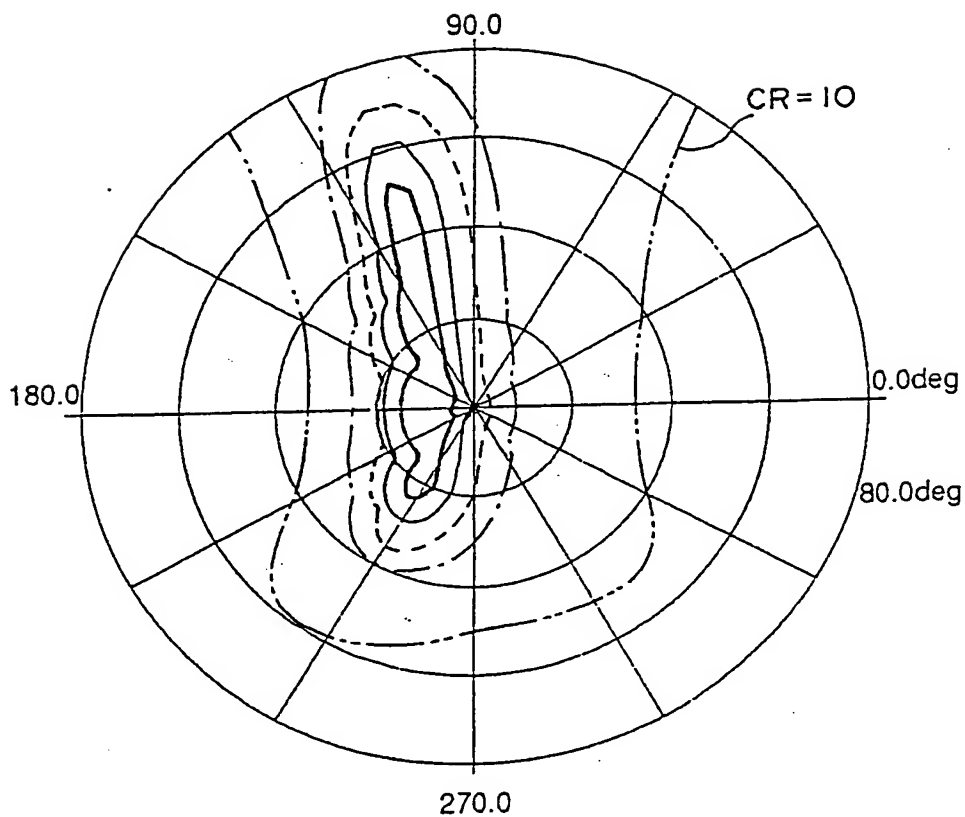
Contrast ratio	
————	500.000
————	200.000
-----	100.000
- - - - -	50.000
· · · · ·	10.000



PRETILT= 80°  
CELL= 3μm, 45° TWIST

46  
FIG. 43

Contrast ratio	
————	500.000
————	200.000
-----	100.000
-----	50.000
-----	10.000



PRETILT = 75°  
CELL = 3  $\mu$  m, 45° TWIST

217  
FIG. 44  
PRIOR ART

Contrast ratio	
————	500.000
————	200.000
- - - - -	100.000
- . . . -	50.000
- . . - -	10.000

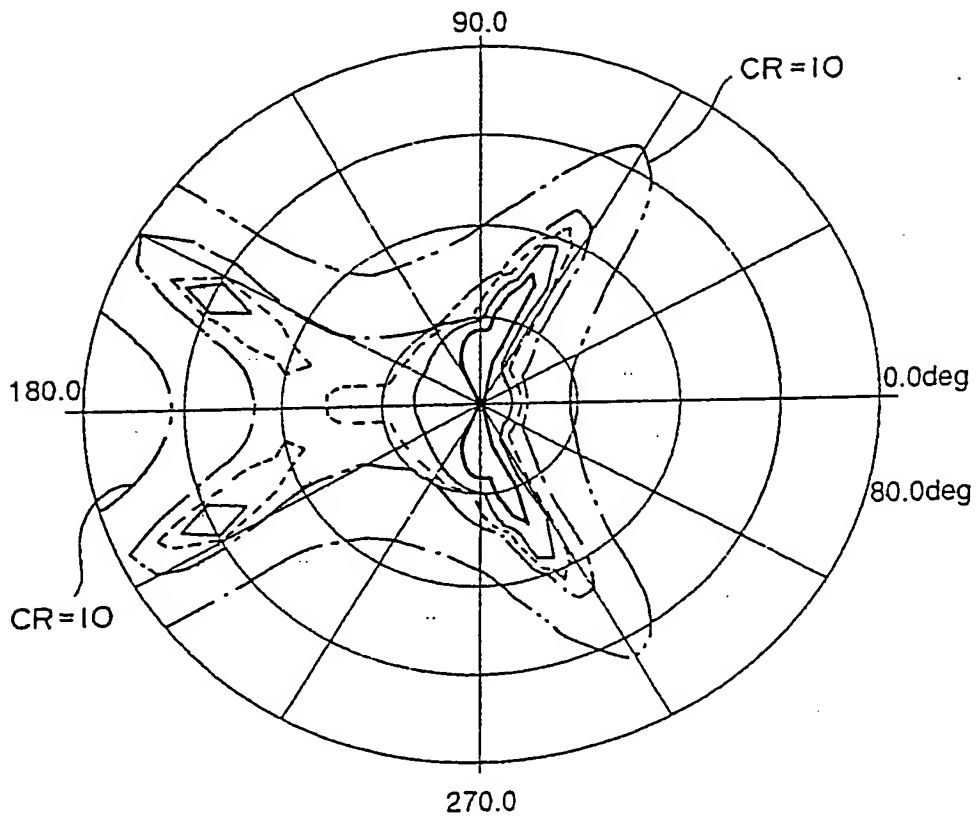
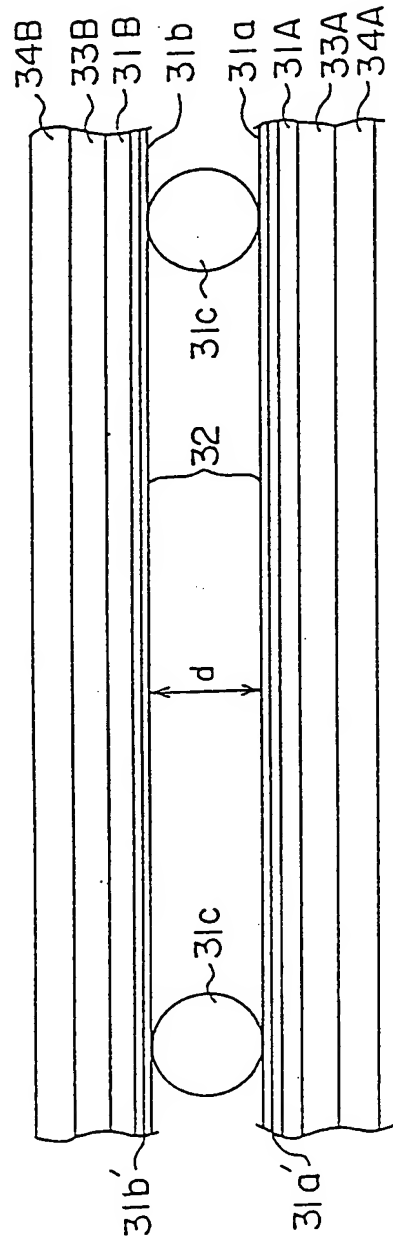
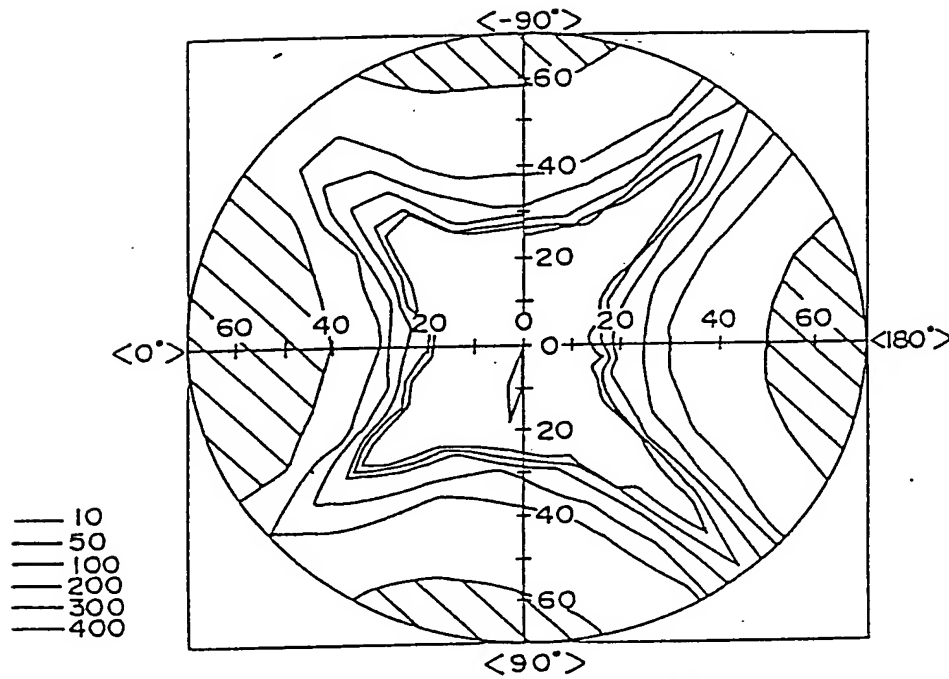


FIG. 45

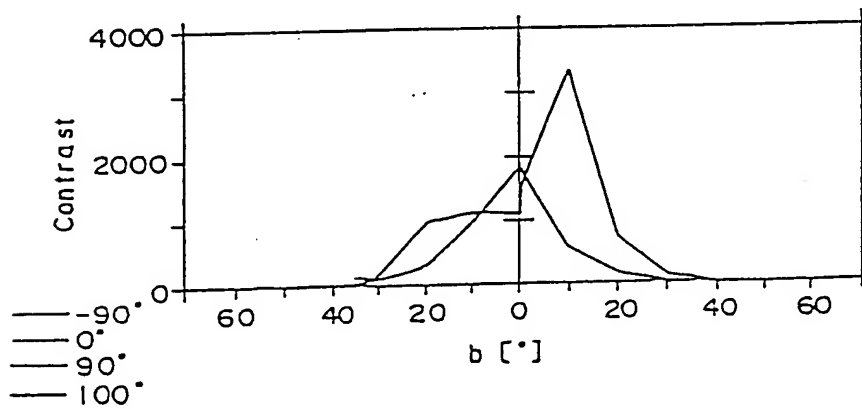
30



49A  
 FIG. 46A



49B  
 FIG. 46B



50A  
 FIG. 47A

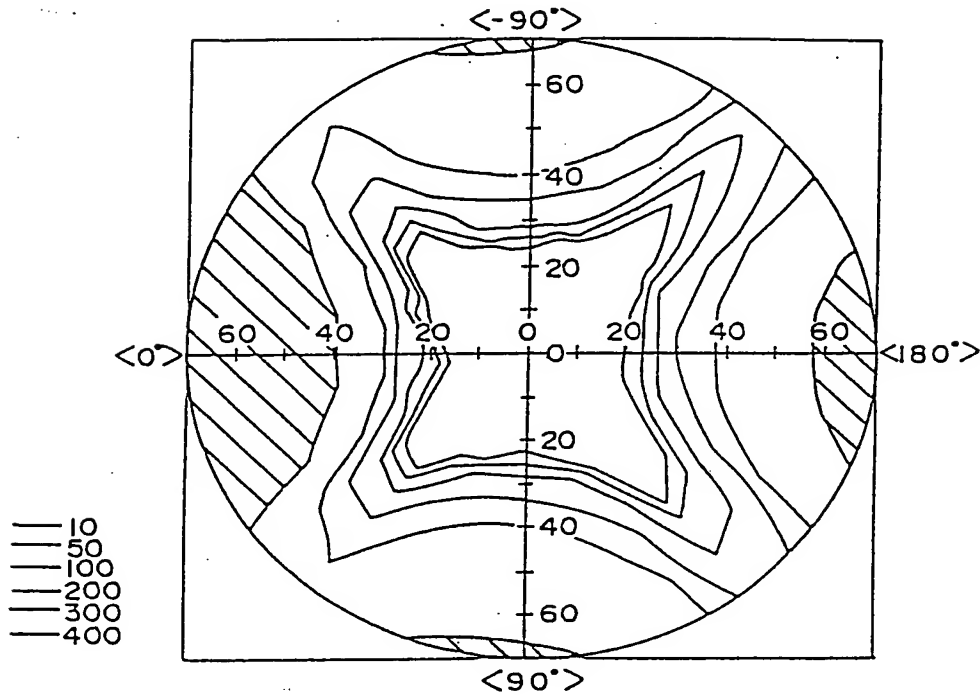
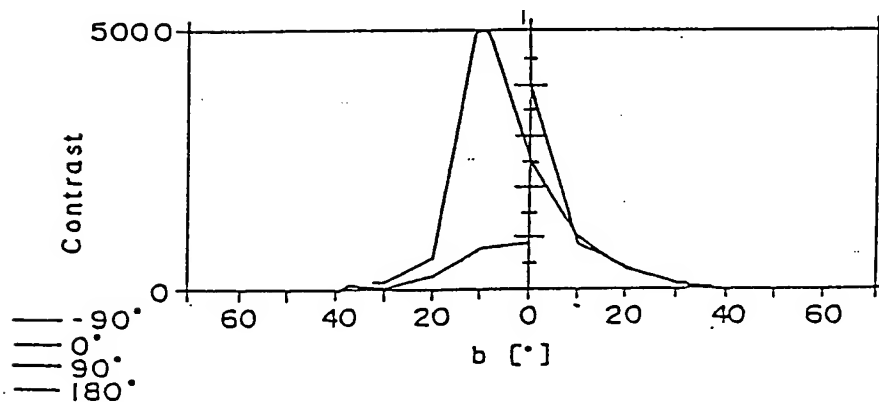
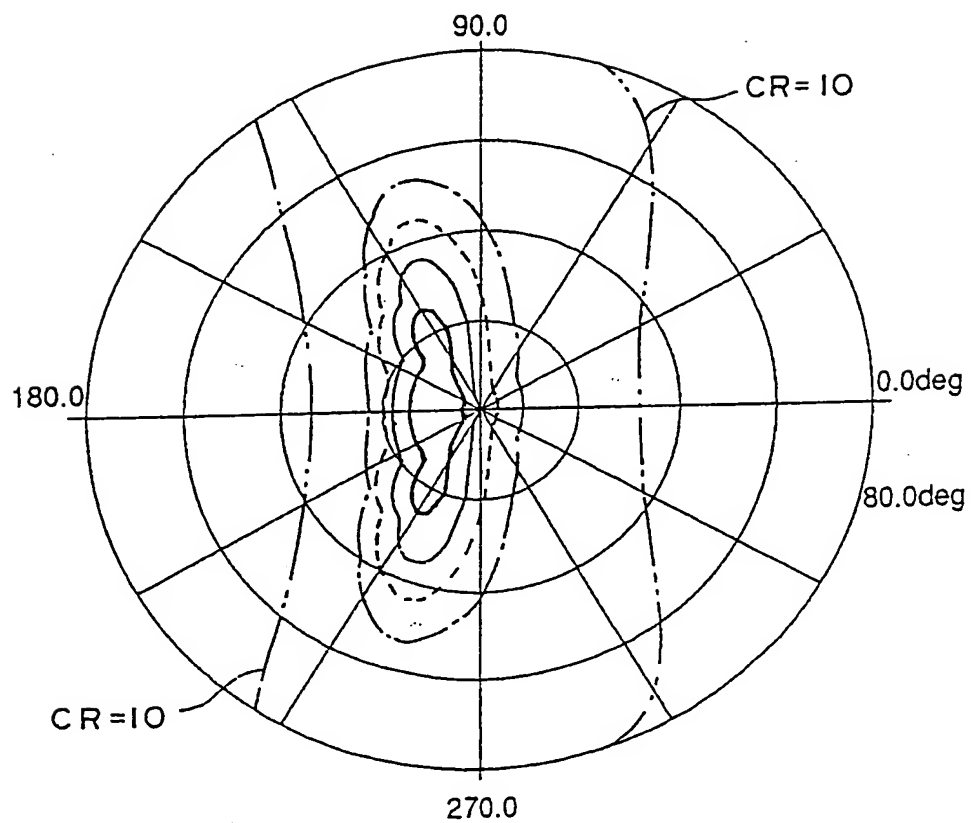


FIG. 47B 50B



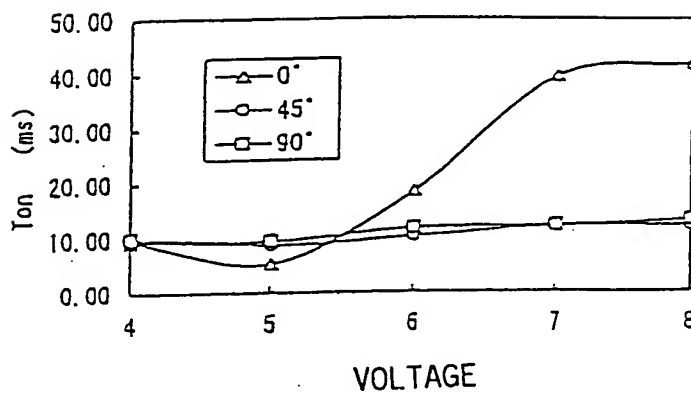
51  
FIG. 48

Contrast ratio	
————	500.000
————	200.000
- - - - -	100.000
— · — · —	50.000
— · — · —	10.000

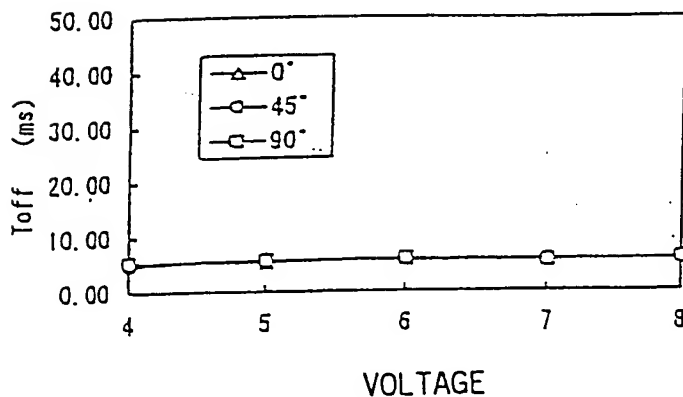


PRITILT = 75°  
CELL = 3 μm, 45° TWIST

52  
FIG. 49

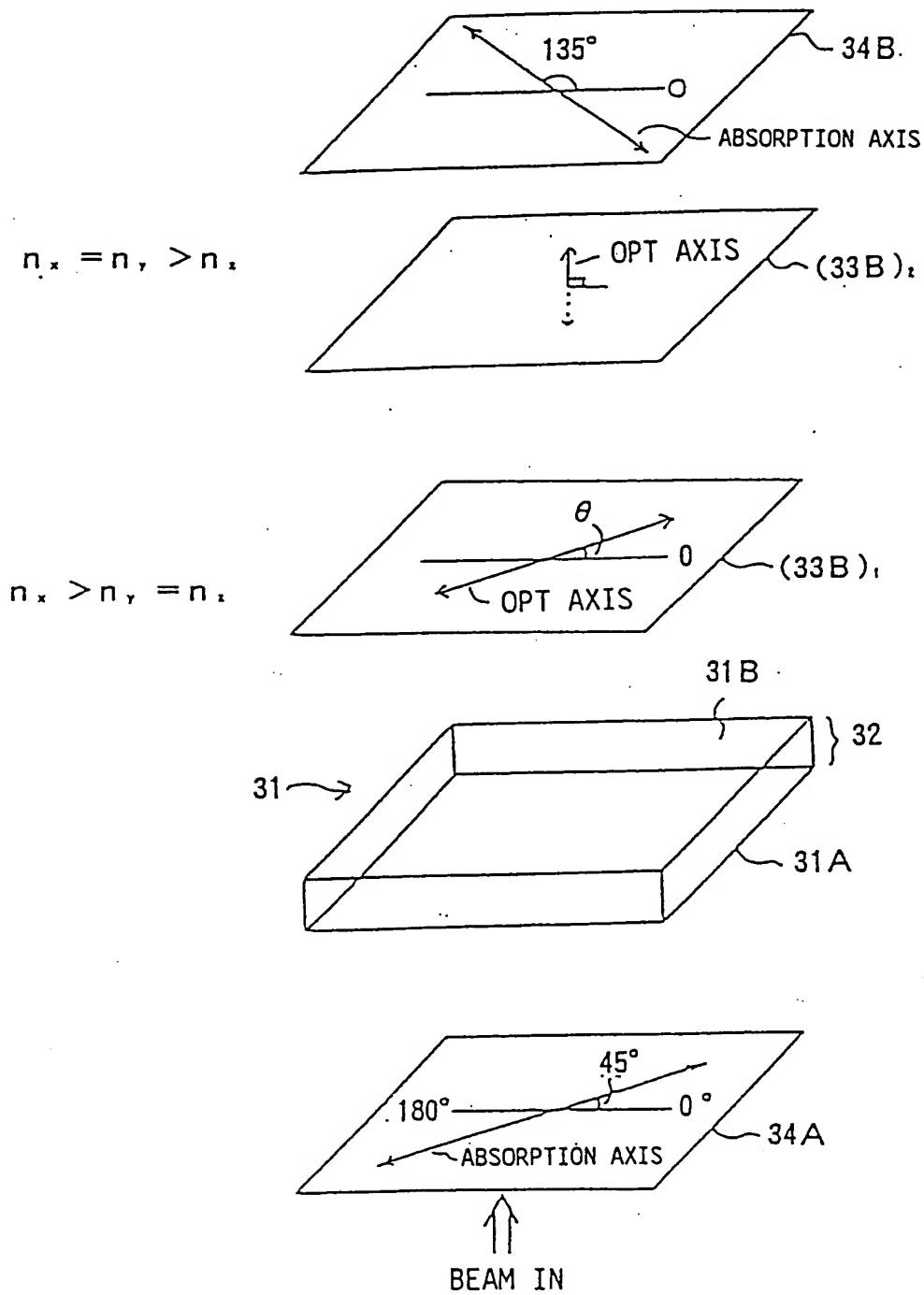


53  
FIG. 50



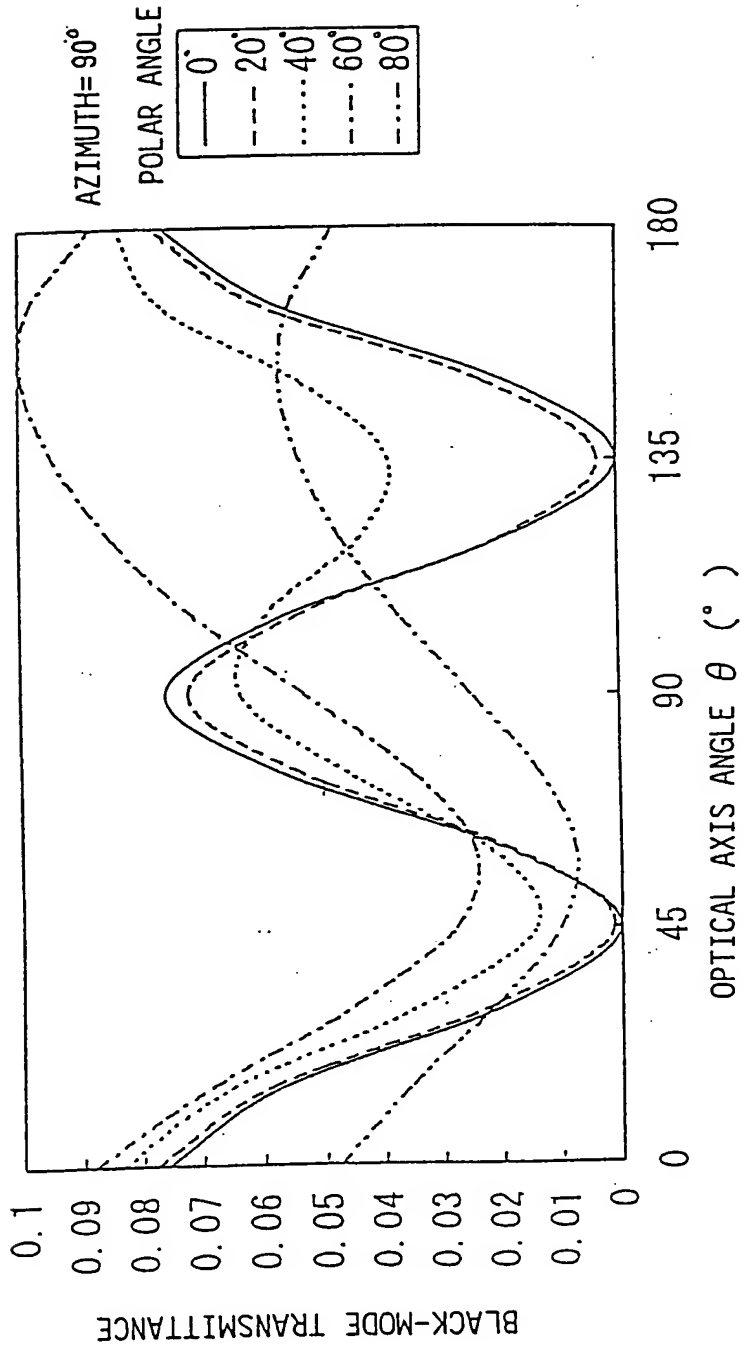
54  
 FIG. 51

40

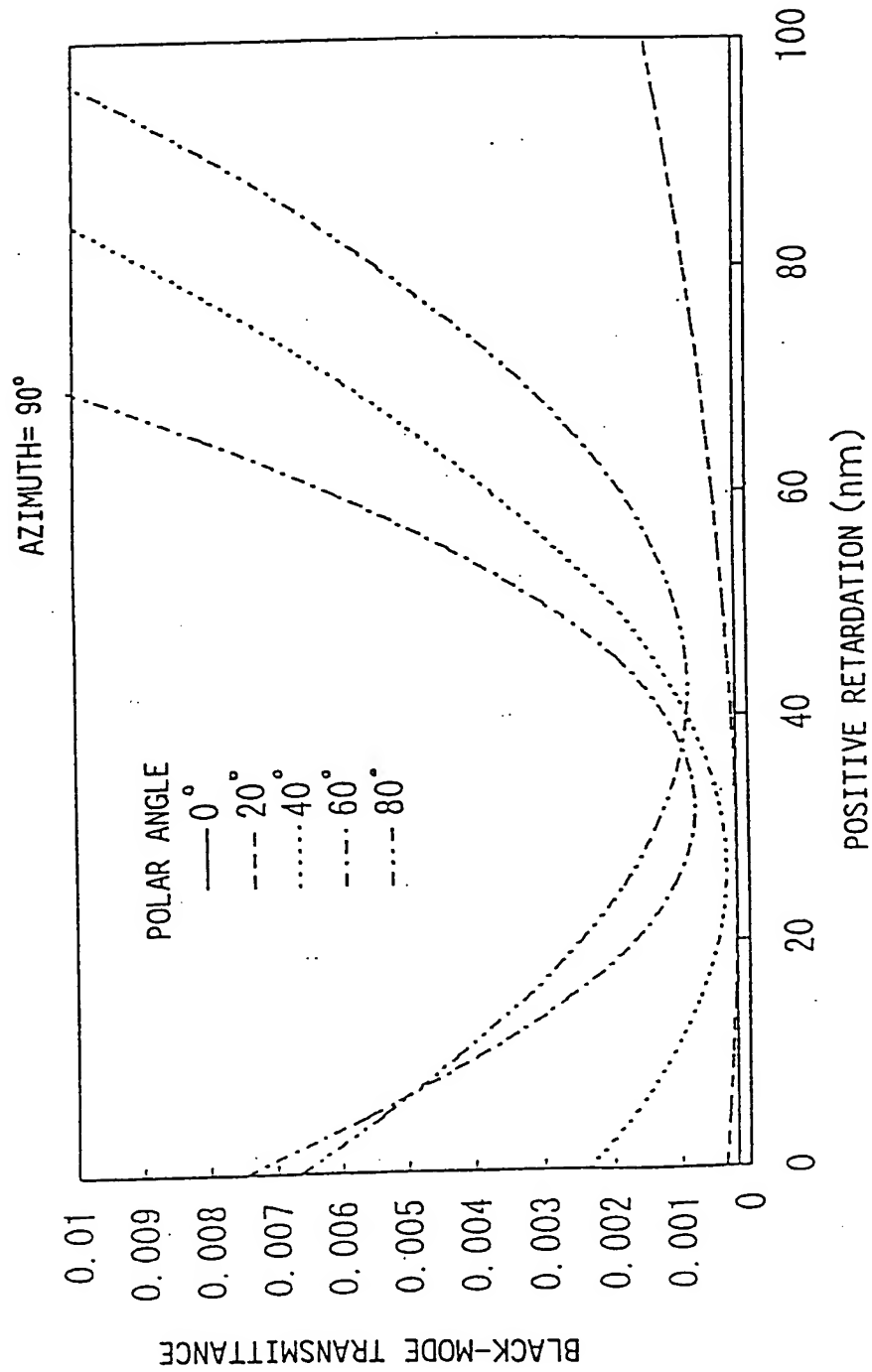


55

FIG. 52



56  
 FIG. 58



【図 57】

FIG 57

図 5 4 の液晶表示装置の視角特性を示す図

Contrast ratio	
————	500.000
-----	200.000
-----	100.000
-----	50.000
-----	10.000

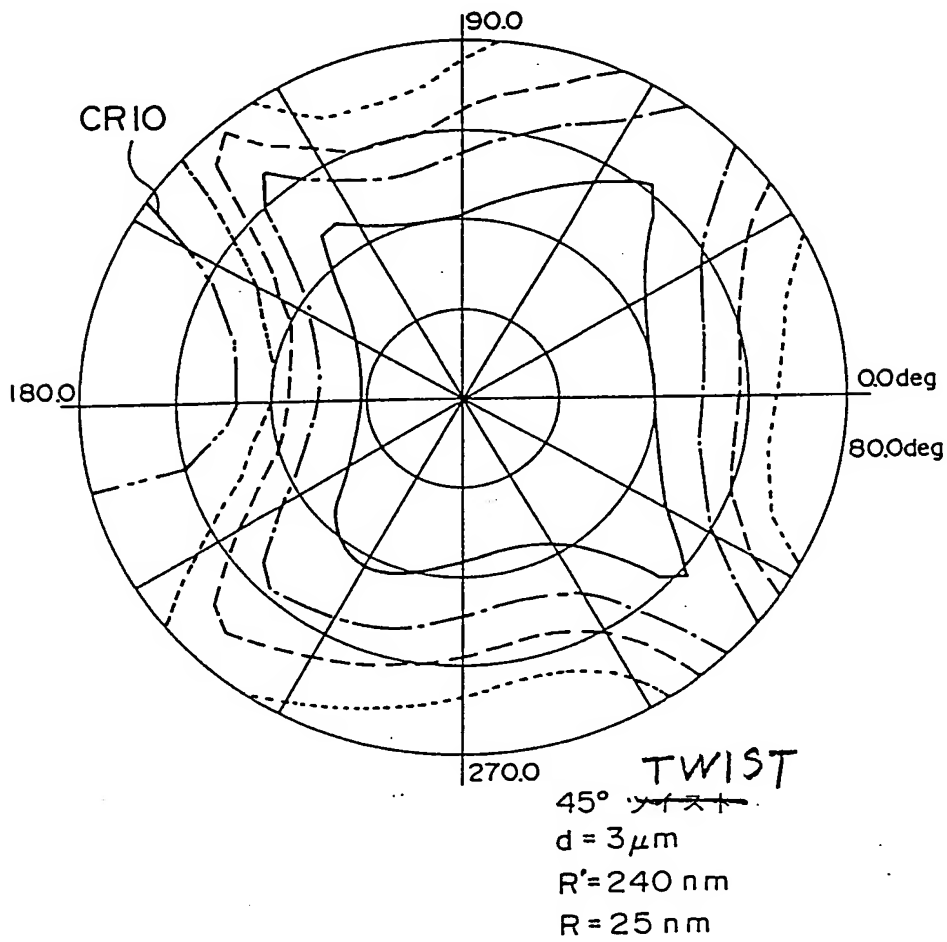
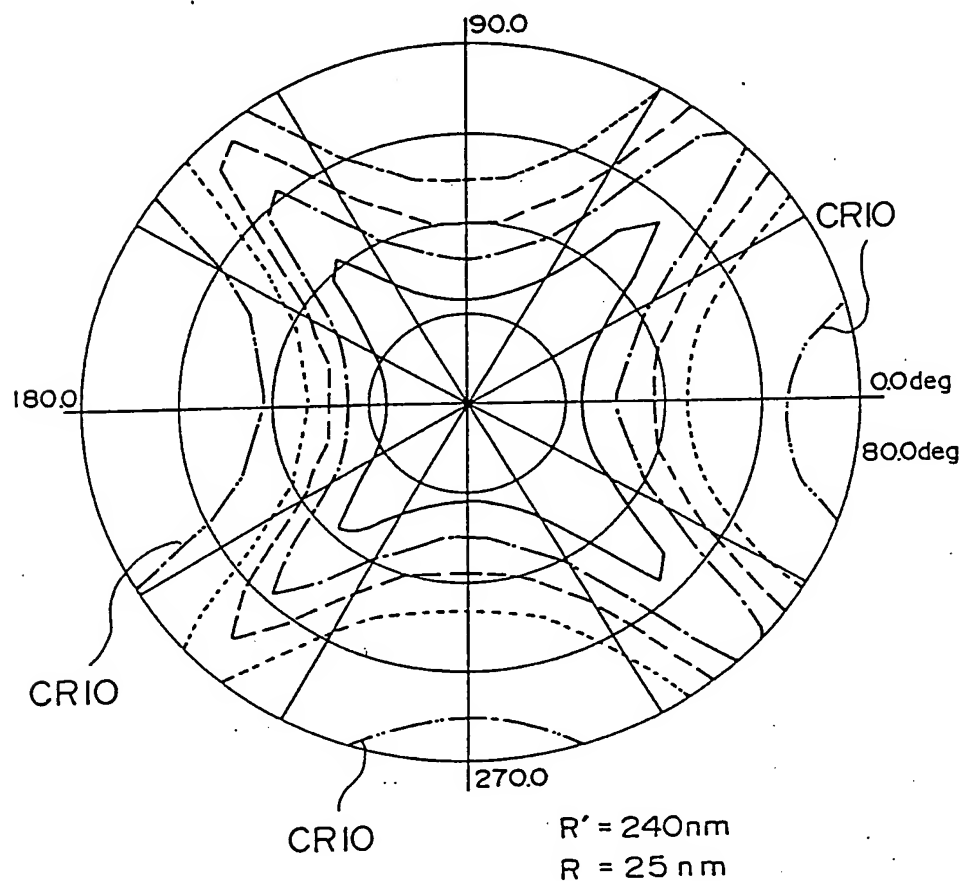


FIG 58

【図 58】

図 5 4 の液晶表示装置において、正の位相差補償フィルムと負の位相差補償フィルムの順序を反転した場合の視角特性を示す図

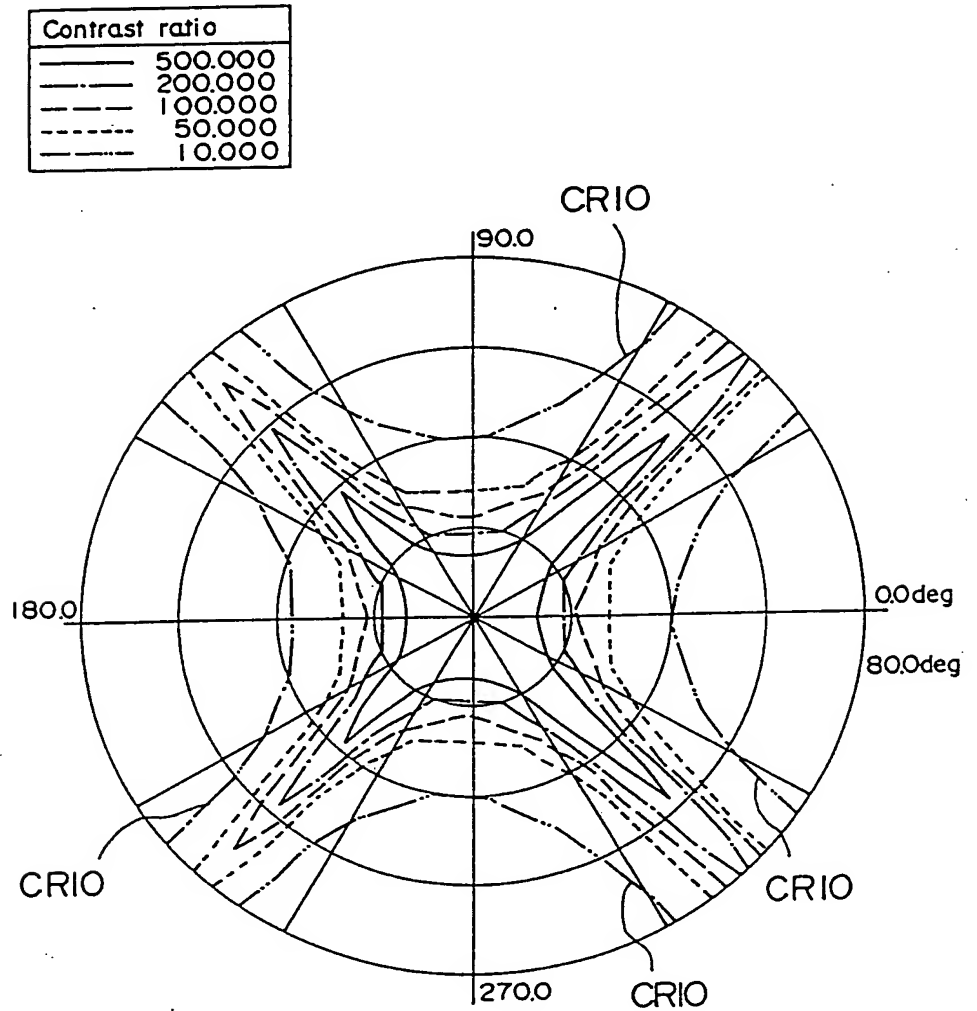
Contrast ratio	
————	500.000
-----	200.000
-----	100.000
-----	50.000
-----	10.000



【図 59】

FIG 59

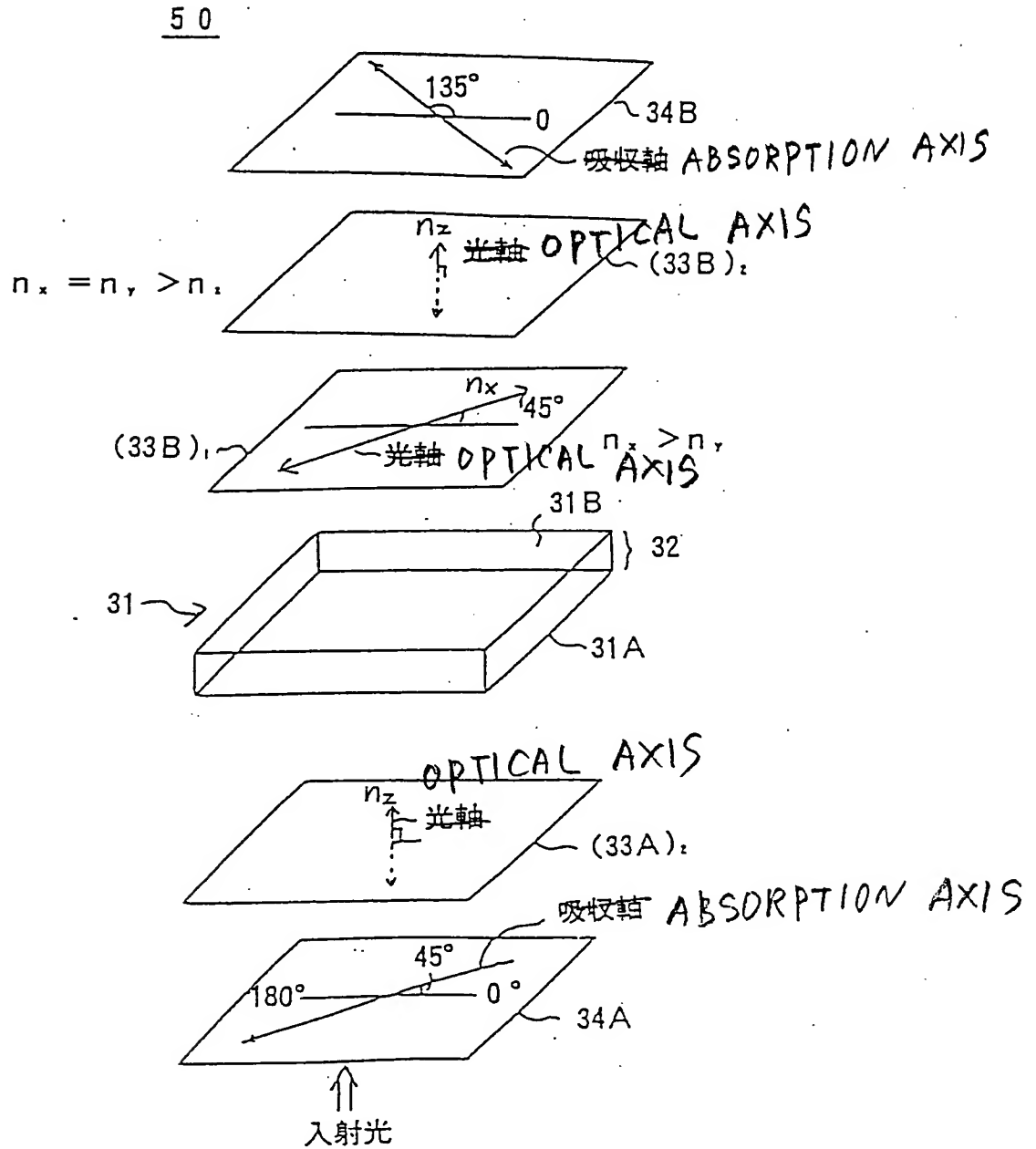
図 5 4 の液晶表示装置において位相差補償フィルム  
を省略した場合の視角特性を示す図



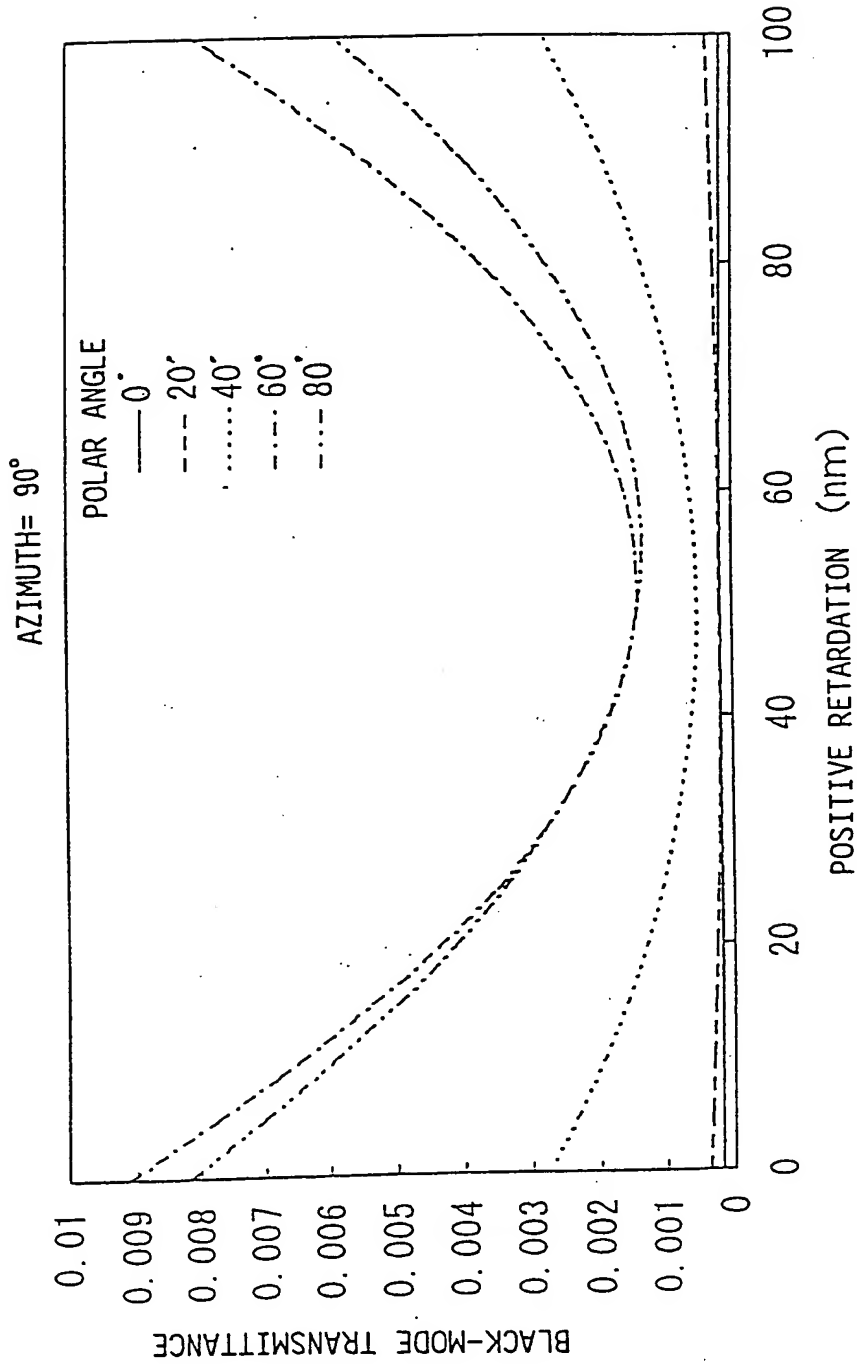
60  
 [図 50]

FIG 60

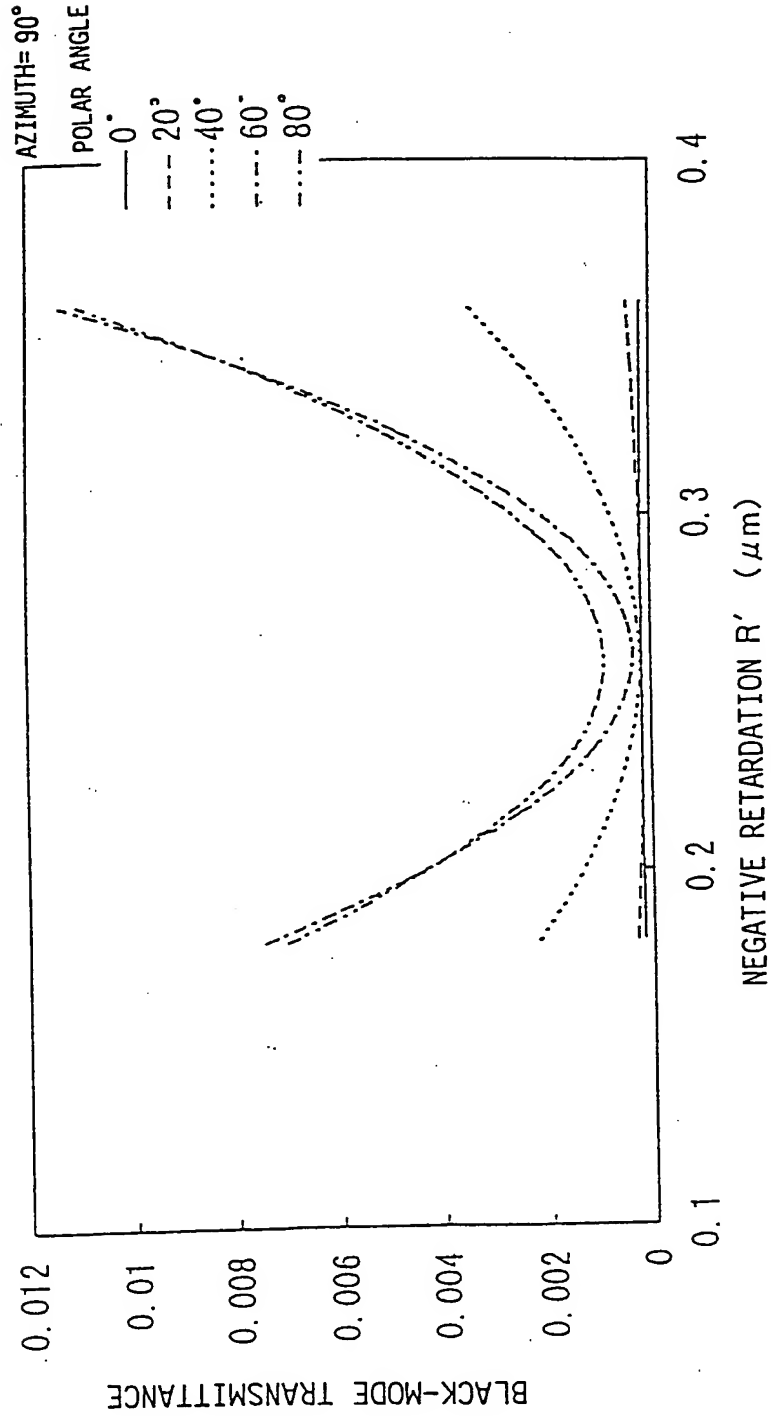
本発明の第4実施例による液晶表示装置の構成を示す図



61  
 FIG. 54

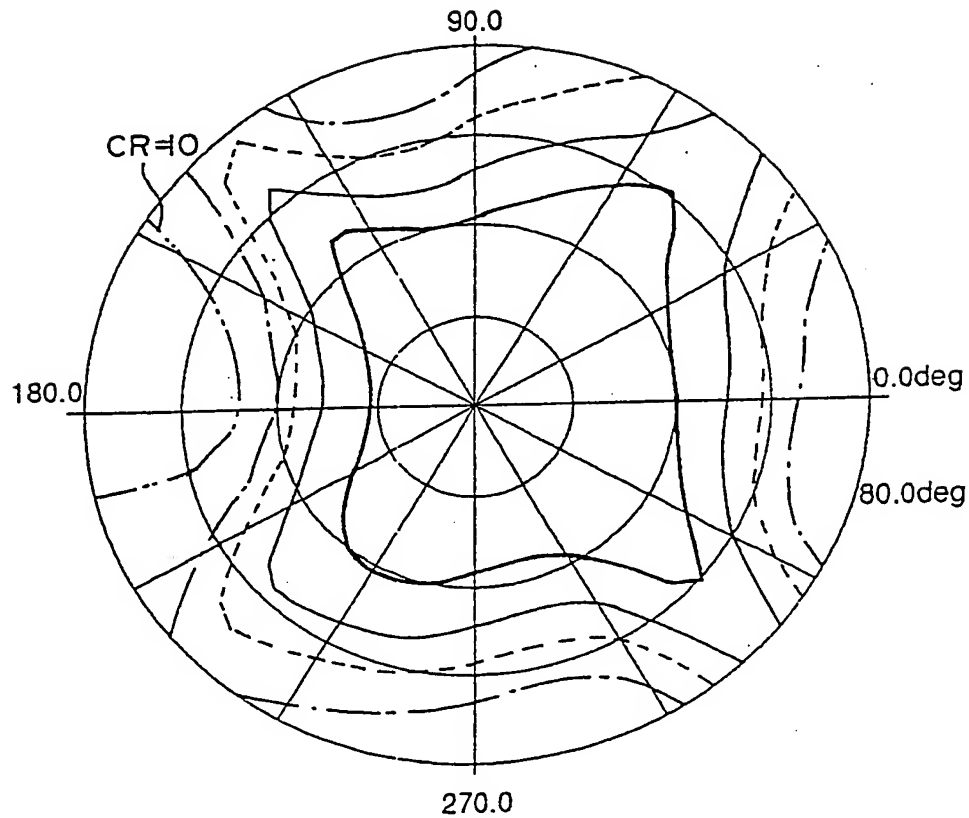


62  
 FIG. 58



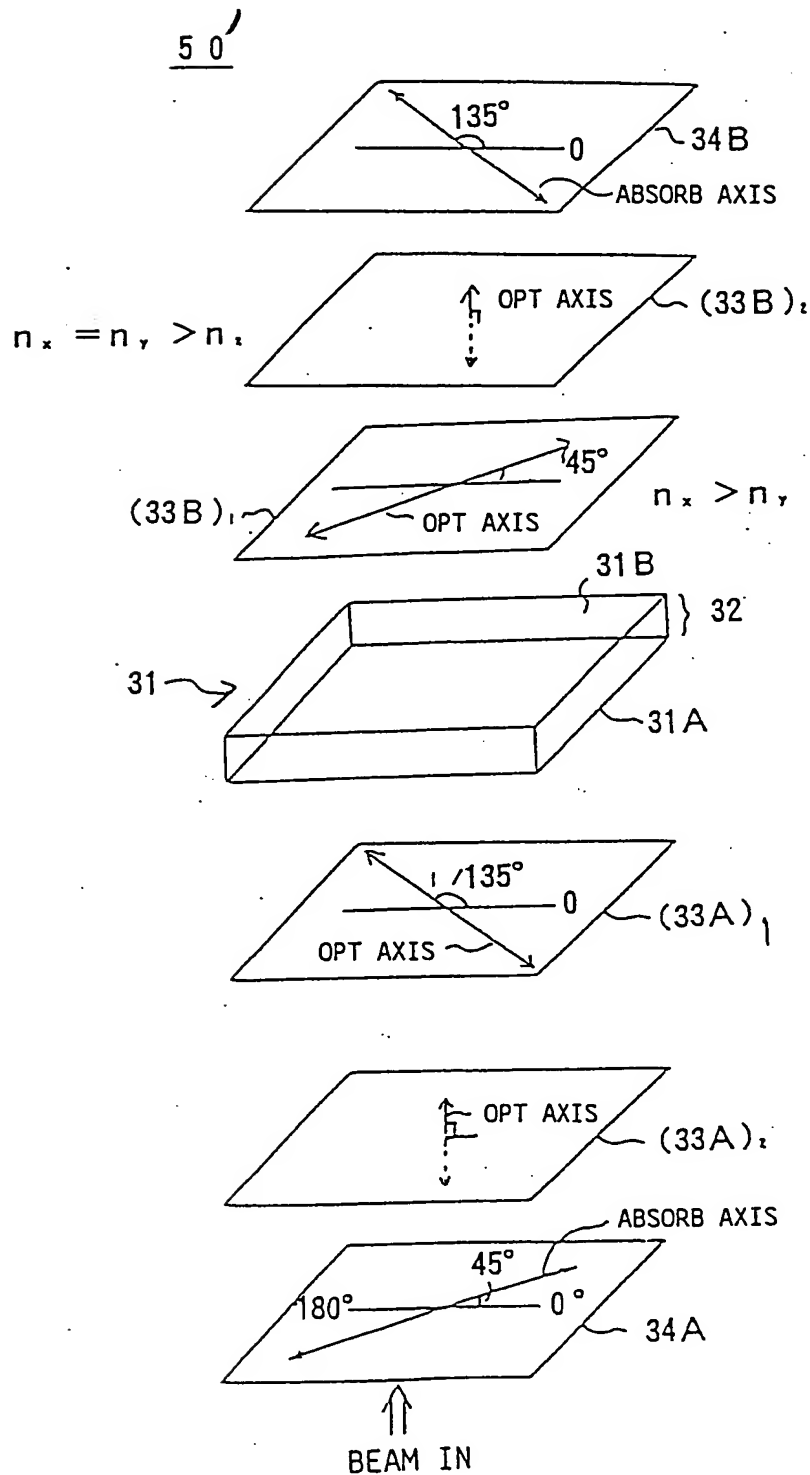
63  
FIG. 56

Contrast ratio	
————	500.000
————	200.000
- - - - -	100.000
————	50.000
- . . . -	10.000

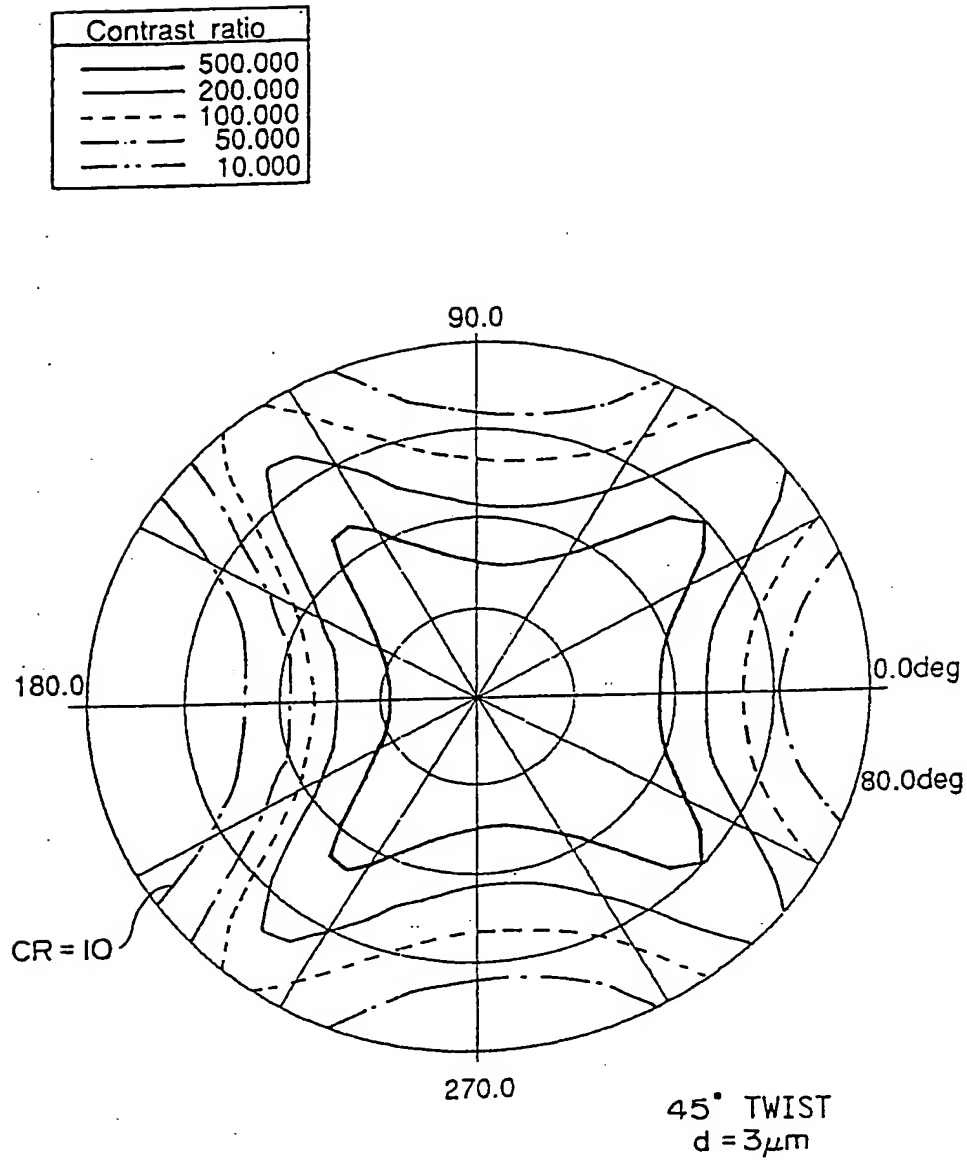


5th

64  
 FIG. 57



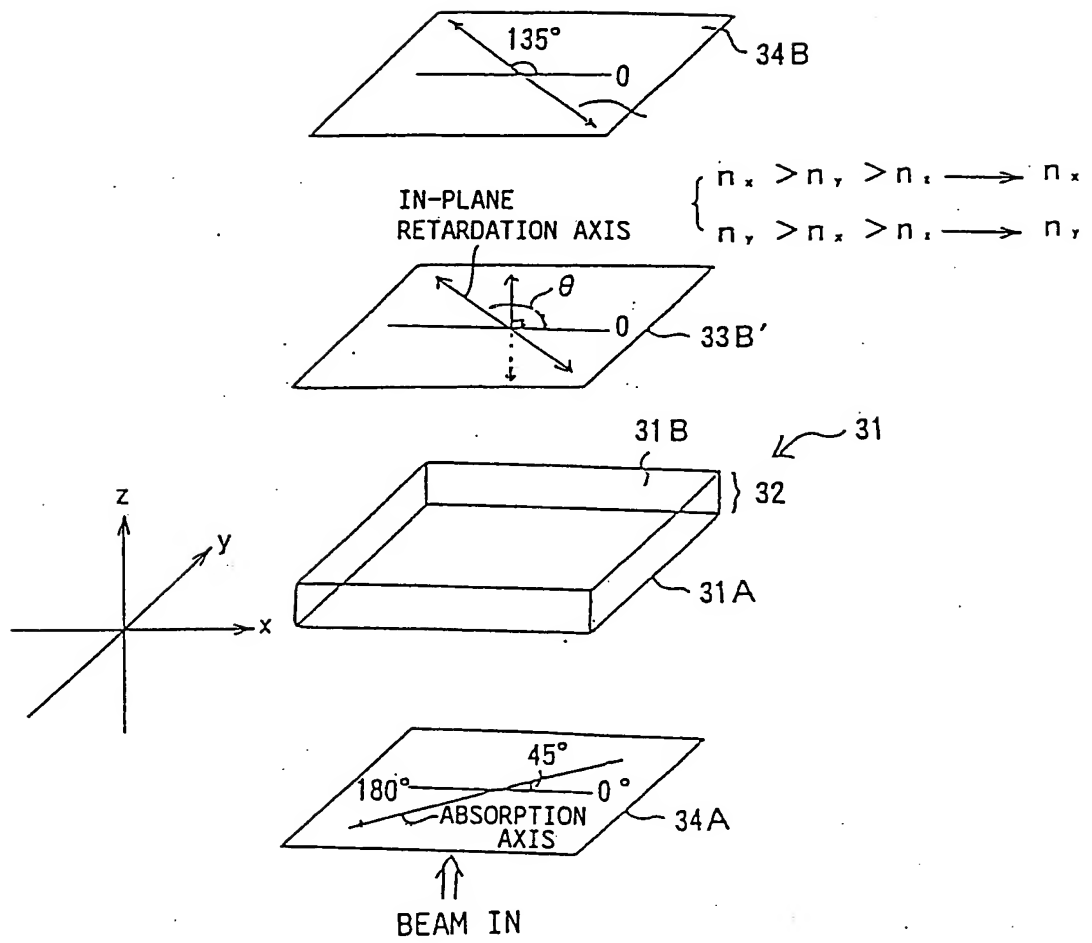
65  
FIG. 58



67d

66  
 FIG. 59

60

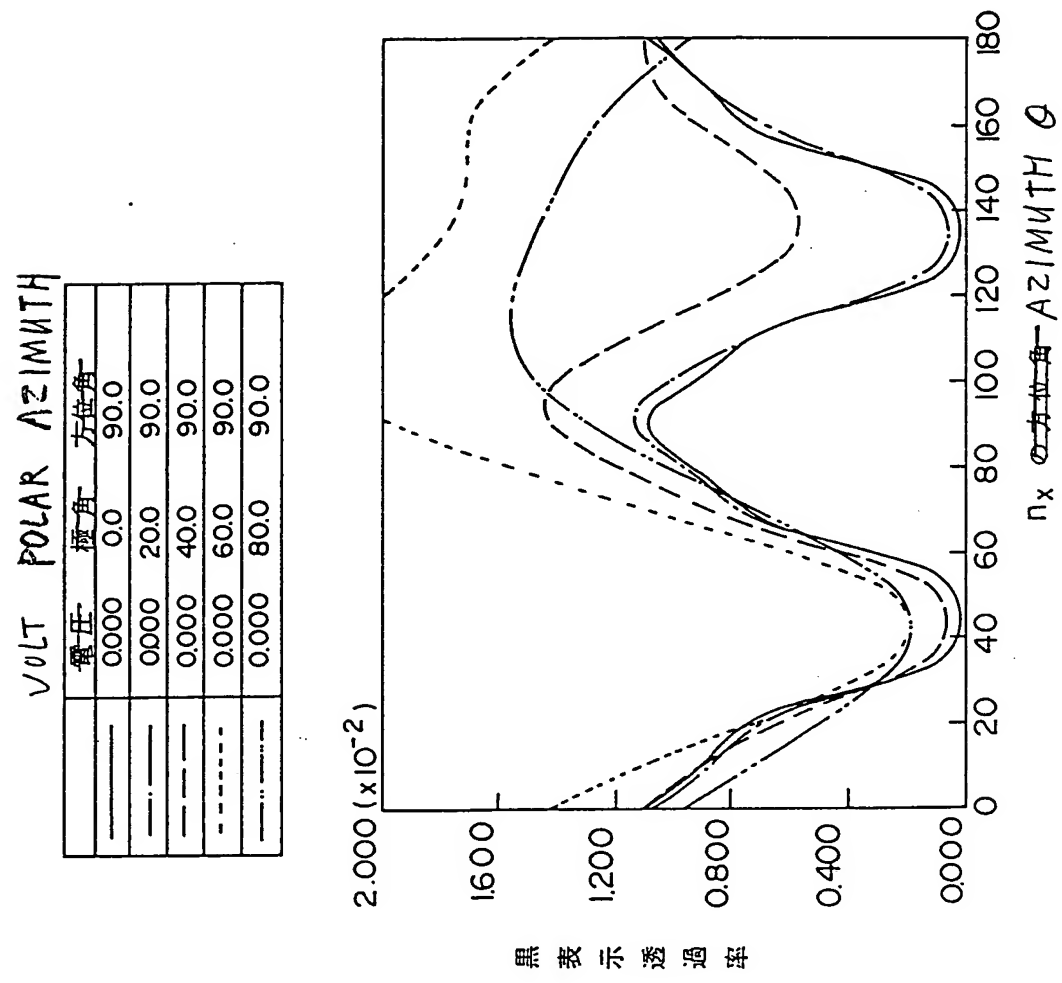


AF96-04207

【図 67】

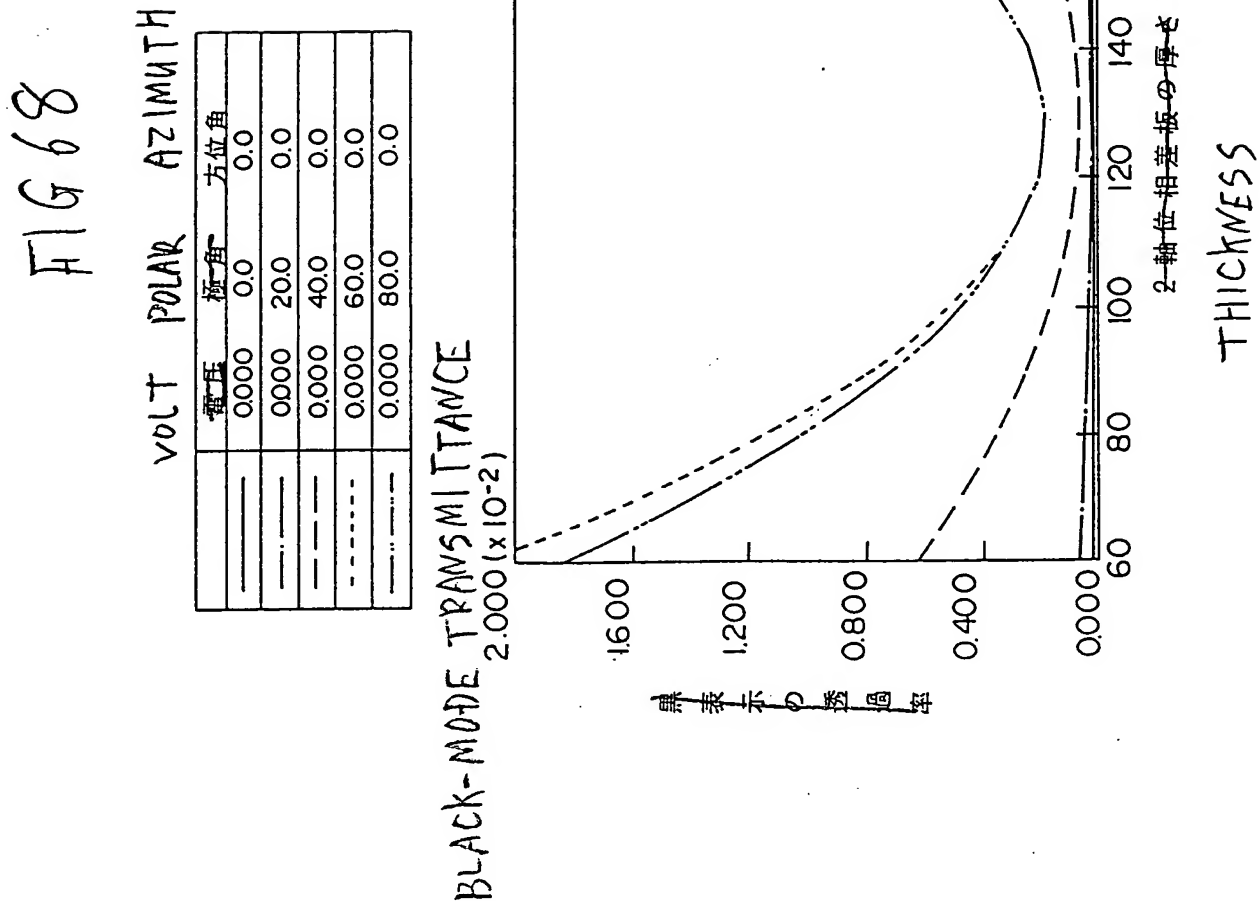
図 6 6 の液晶表示装置の黒表示状態の透過率を示す図

FIG 67



【図 68】

図 6 6 の液晶表示装置の黒表示状態の透過率を示す別の図

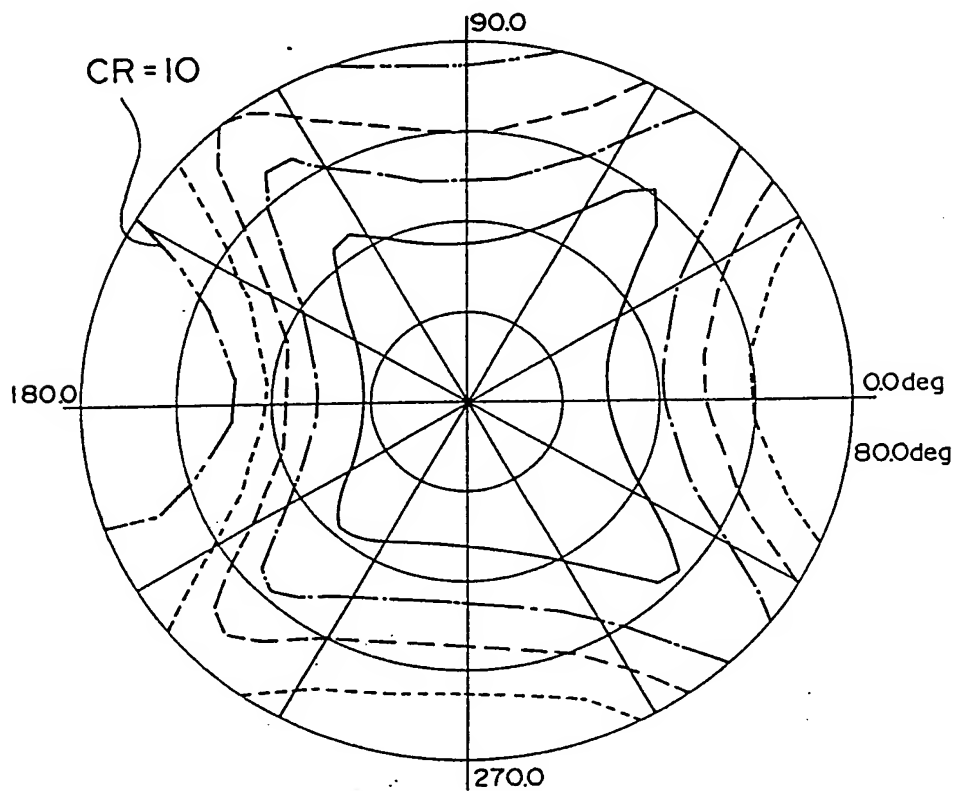


【図 69】

FIG 69

図 6 6 の液晶表示装置の視角特性を示す図

Contrast ratio	
————	500.000
————	200.000
-----	100.000
-----	50.000
-----	10.000

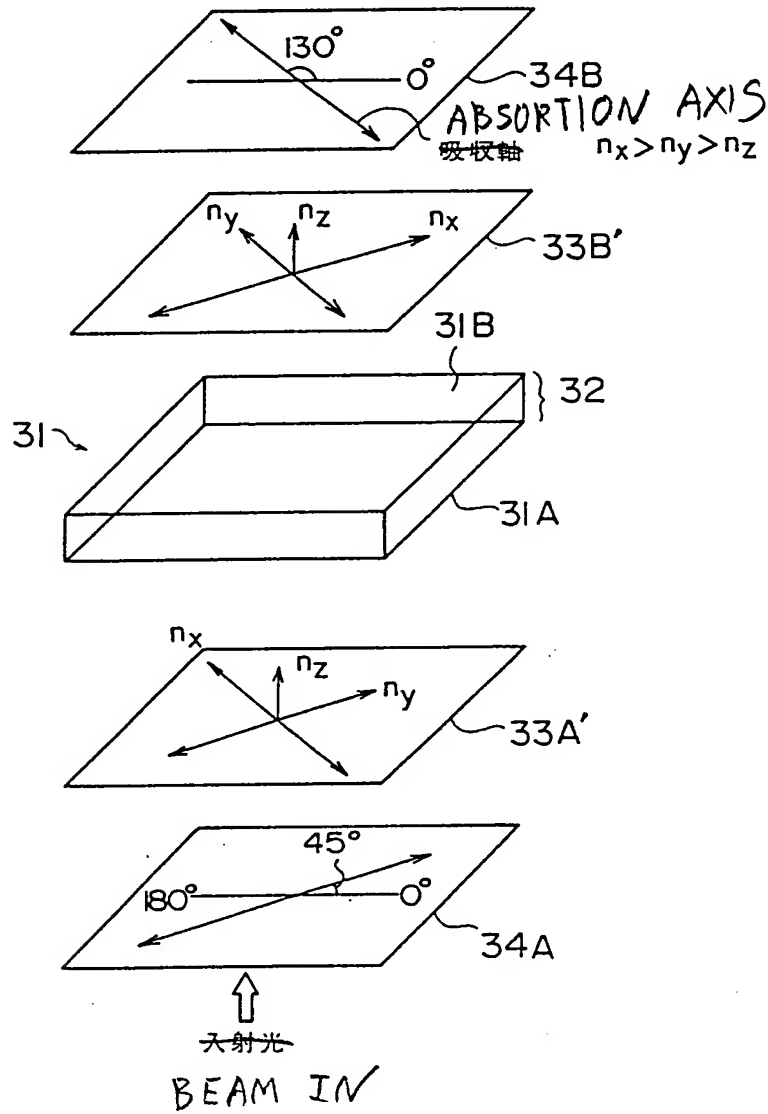


【図 70】

FIG 70

本発明の第7実施例による液晶表示装置の構成を示す図

70

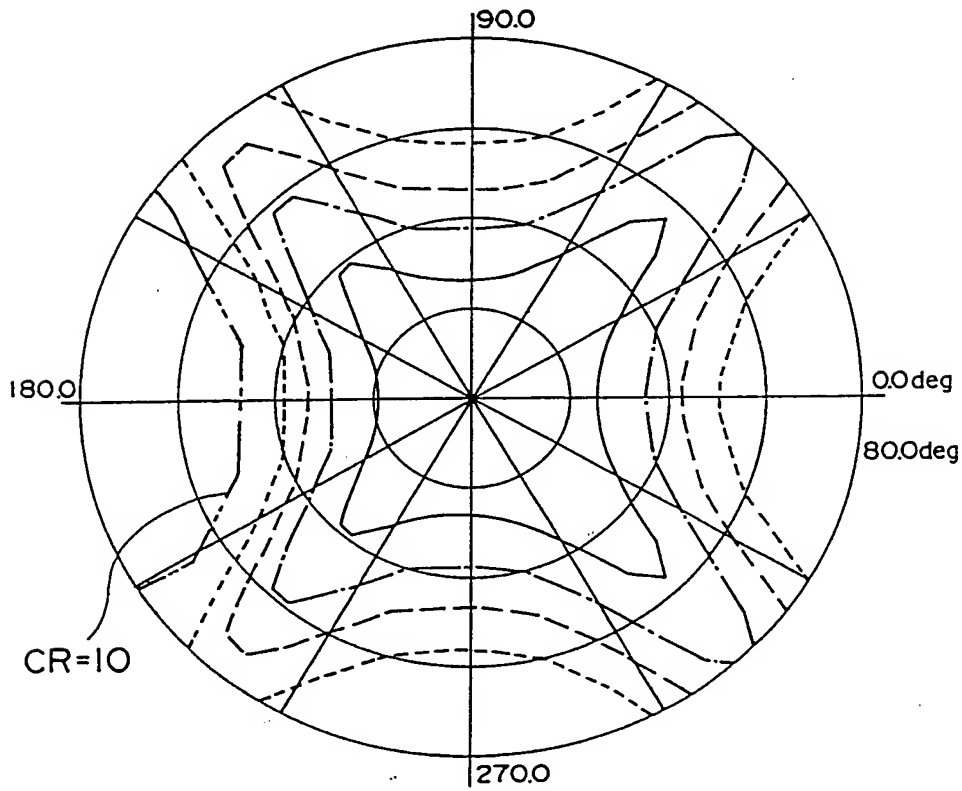


【図 71】

FIG 71

図 7 0 の液晶表示装置の視角特性を示す図

Contrast ratio	
————	500.000
-----	200.000
-----	100.000
-----	50.000
-----	10.000



【図 72】

FIG 72

本発明の第 8 実施例による液晶表示装置の構成を示す図

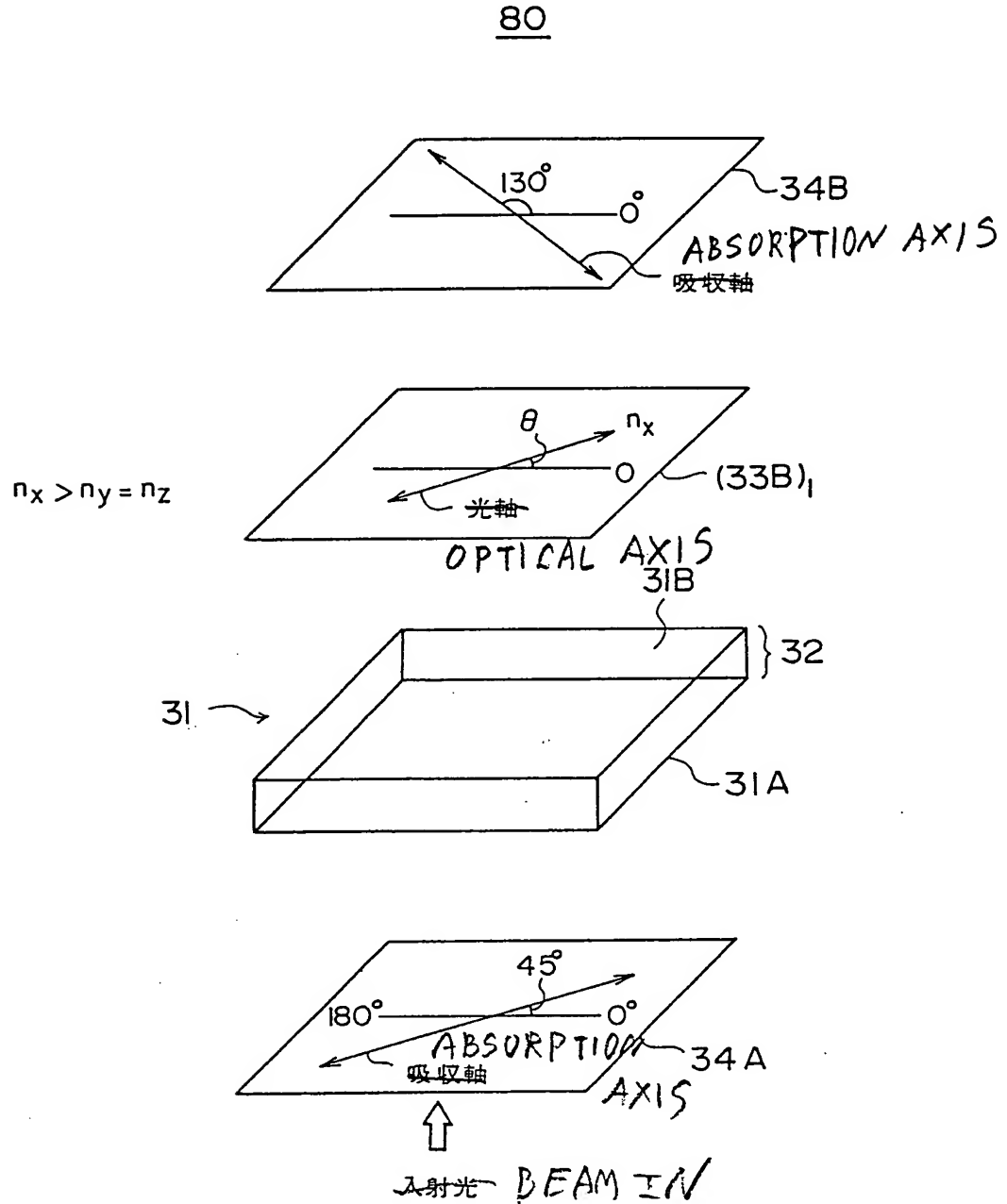
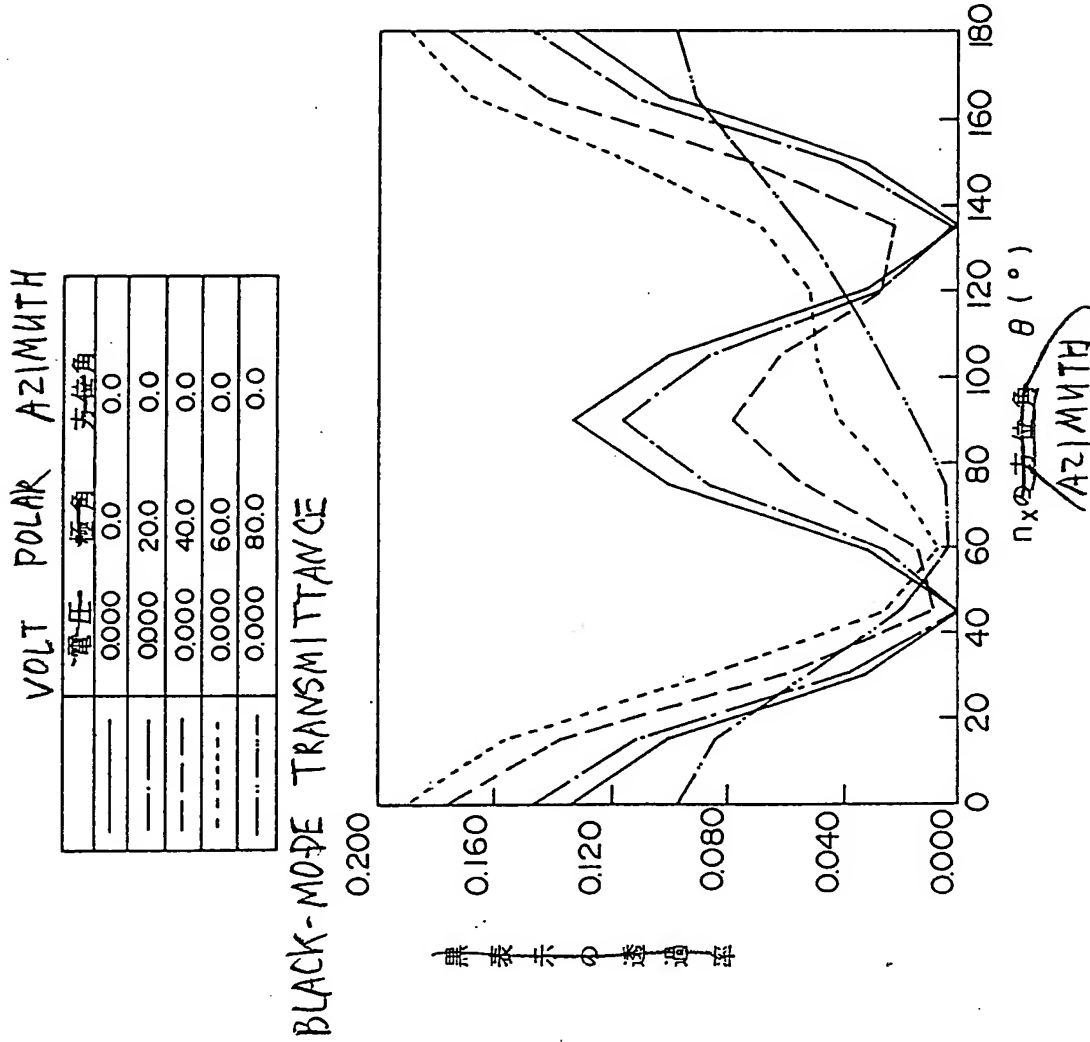


FIG 73

【図 73】

図 7 2 の液晶表示装置における黒表示状態の透過率を示す図

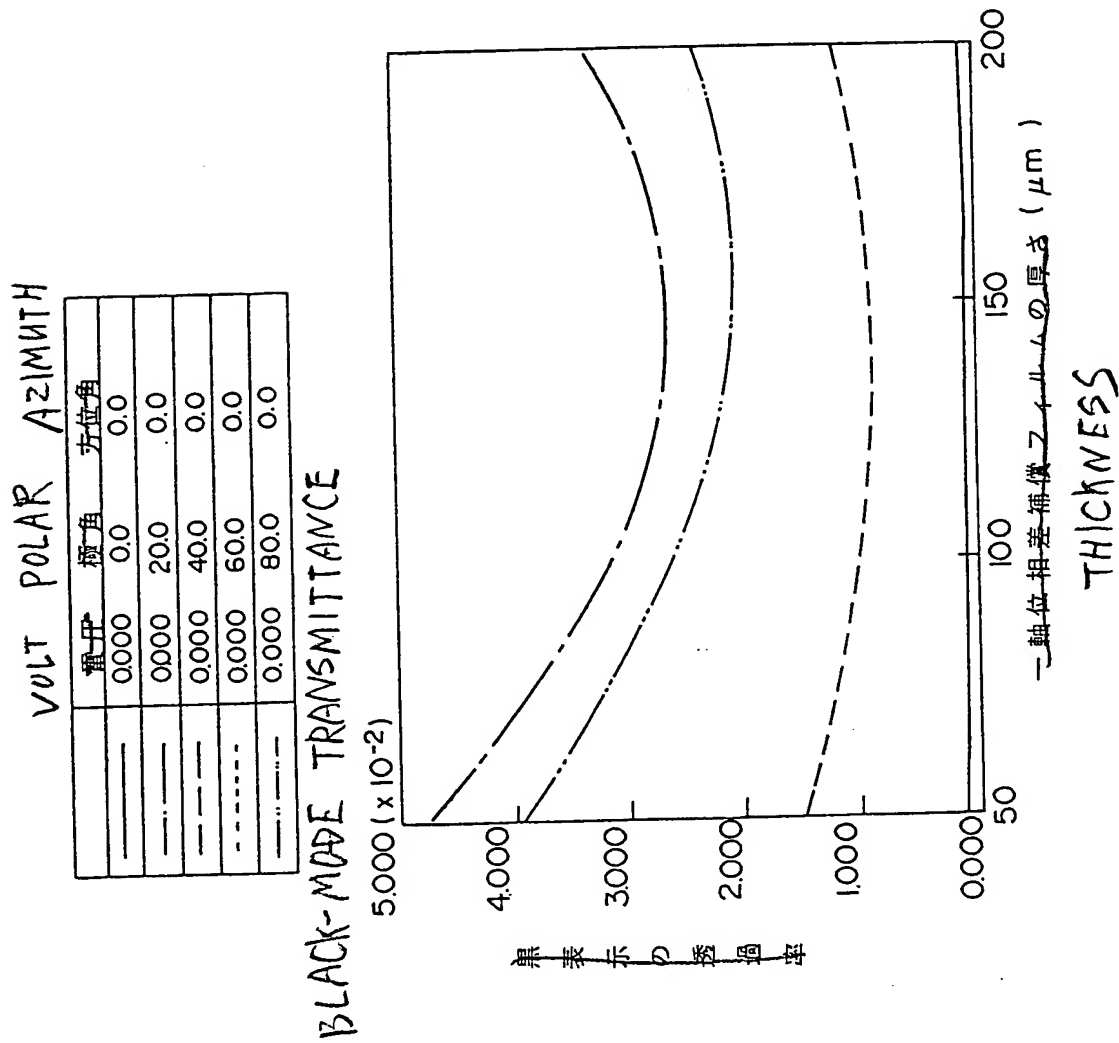


SF 96-04267

FIG 74

【図 74】

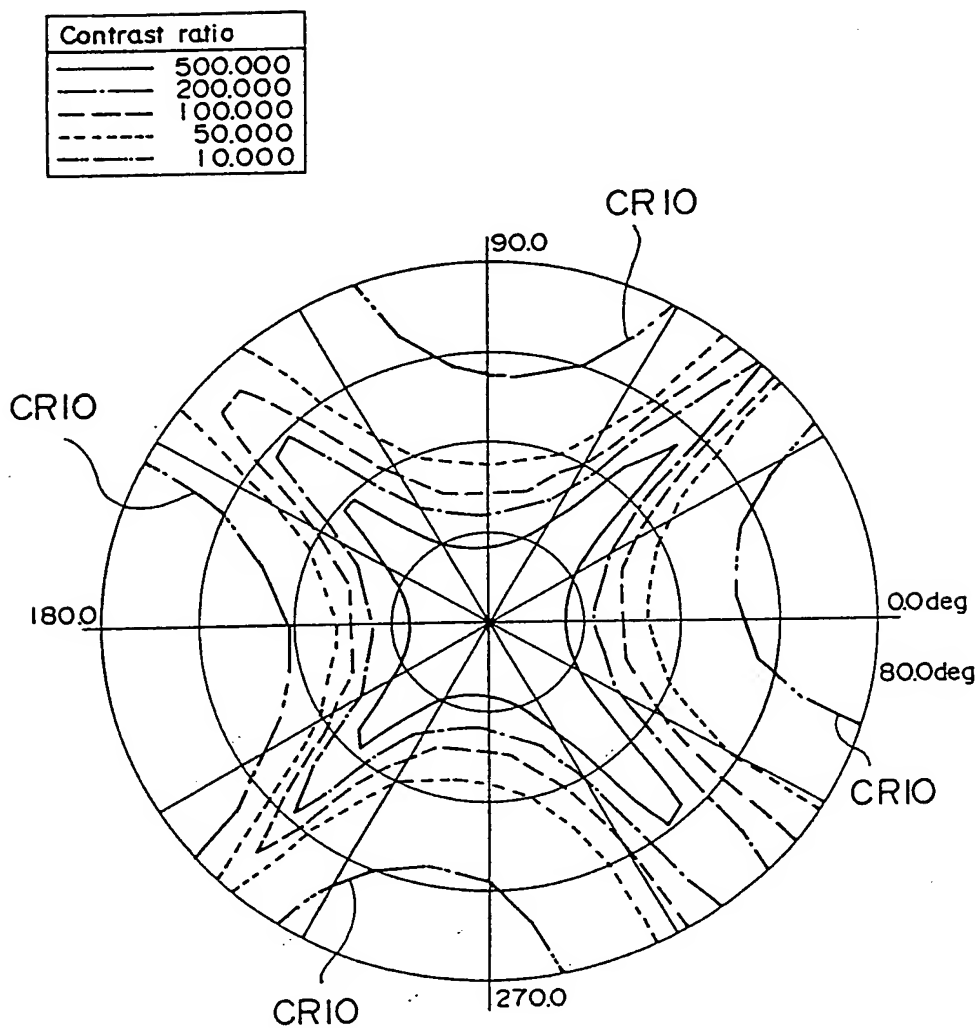
図 7 2 の液晶表示装置における黒表示状態の透過率を示す図



【図 75】

FIG 75

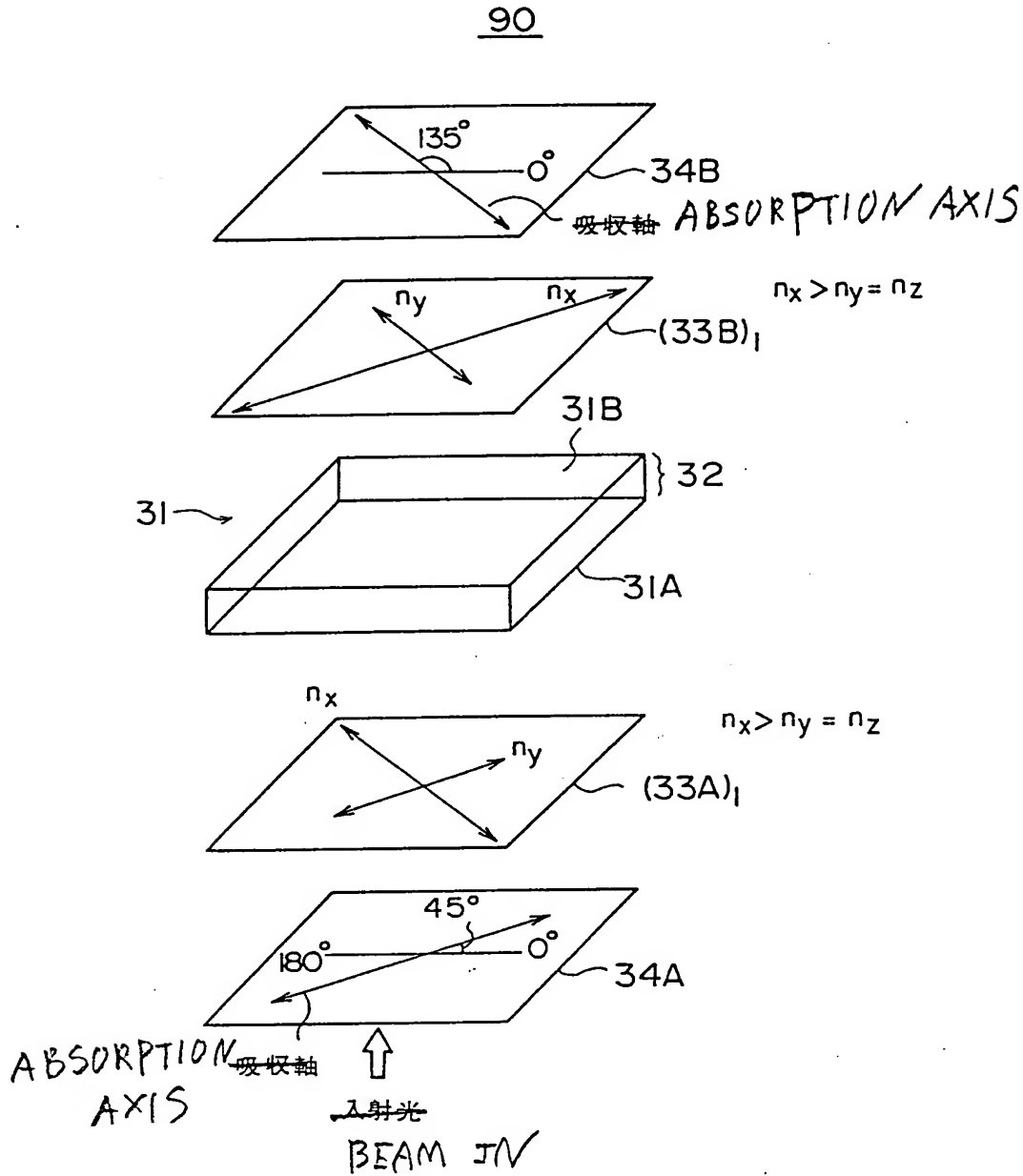
図 7 2 の液晶表示装置の視角特性を示す図



【図 76】

FIG 76

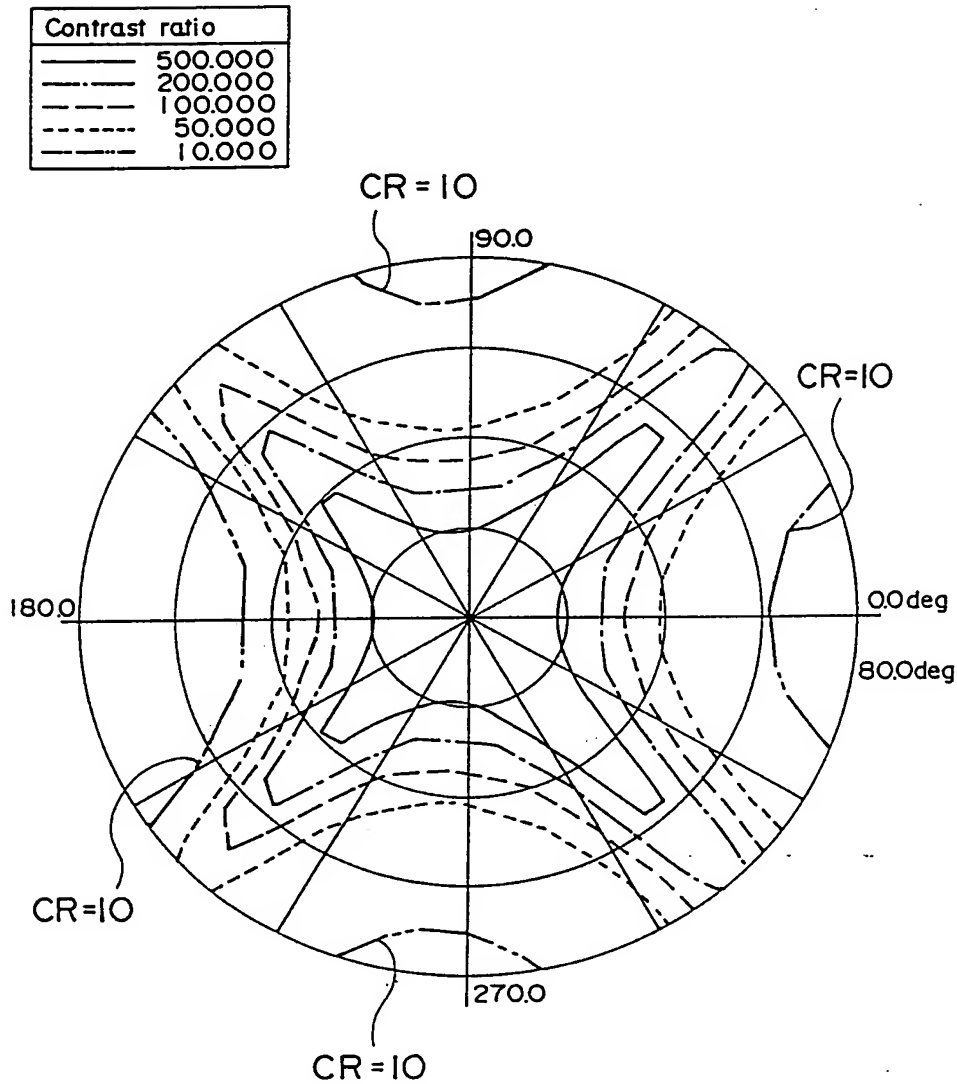
本発明の第 9 実施例による液晶表示装置の構成を示す図



【図 77】

FIG 77

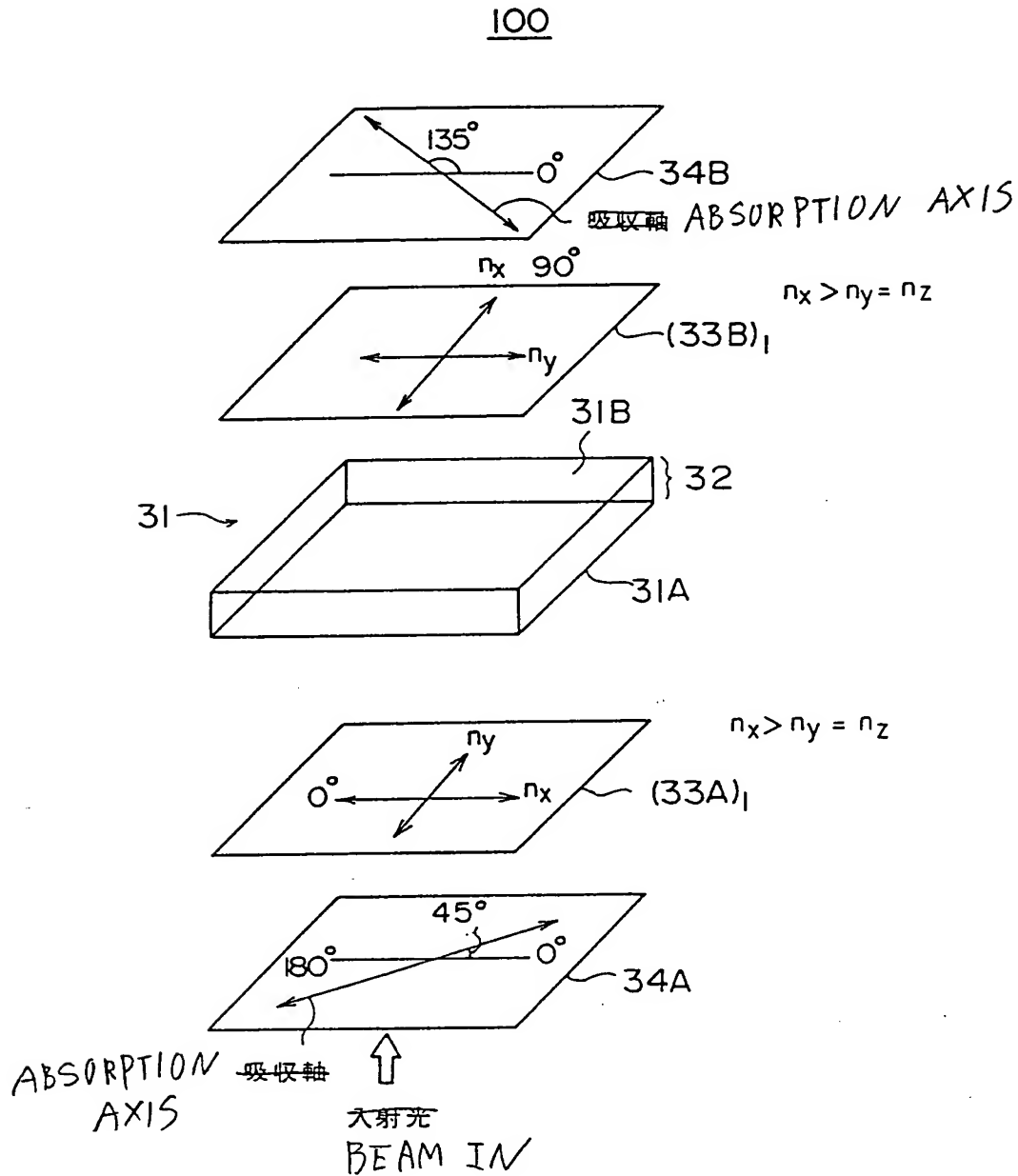
図 7 6 の液晶表示装置の視角特性を示す図



【図78】

FIG 78

本発明の第10実施例による液晶表示装置の構成を示す図



【図 79】

FIG 79

図 7 8 の液晶表示装置の視角特性を示す図

Contrast ratio	
————	500.000
— · — ·	200.000
-----	100.000
-----	50.000
-----	10.000

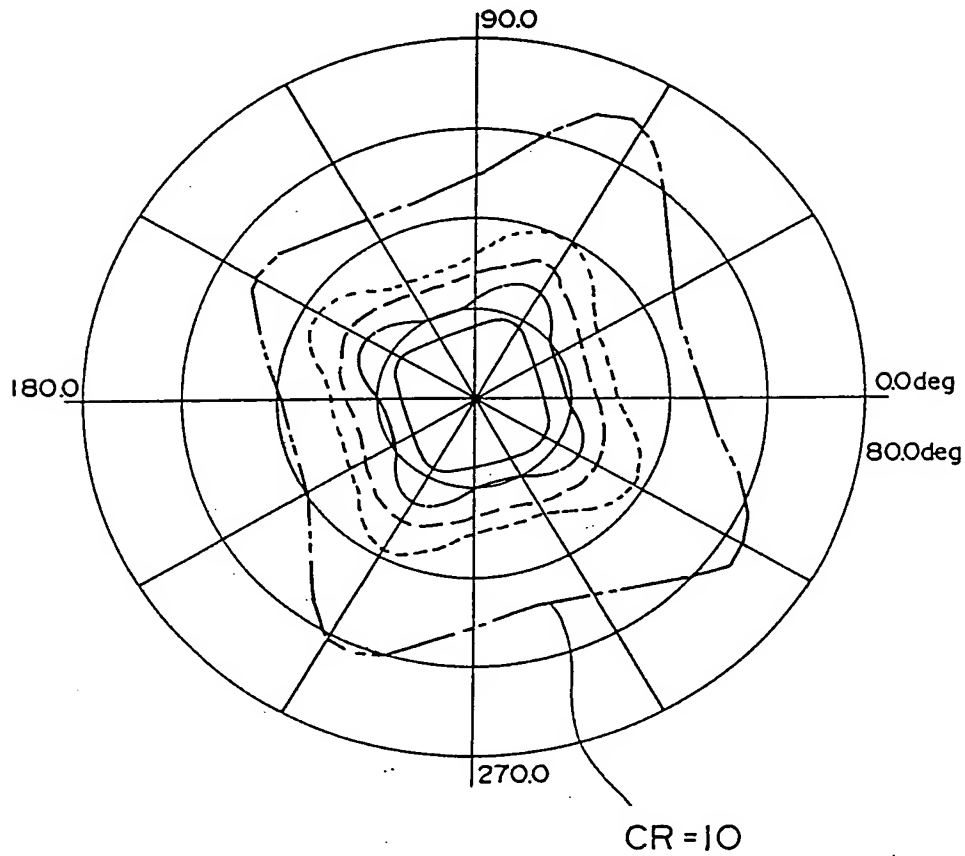


FIG 80

~~FIG. 60~~

TO 110

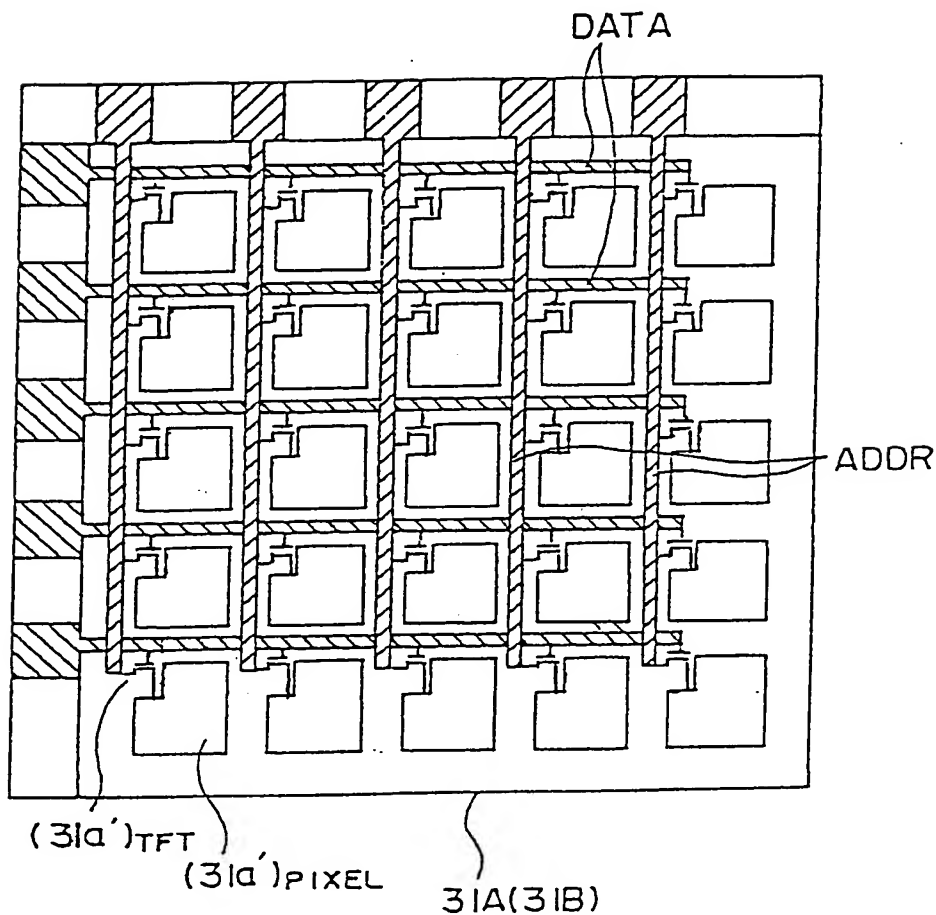
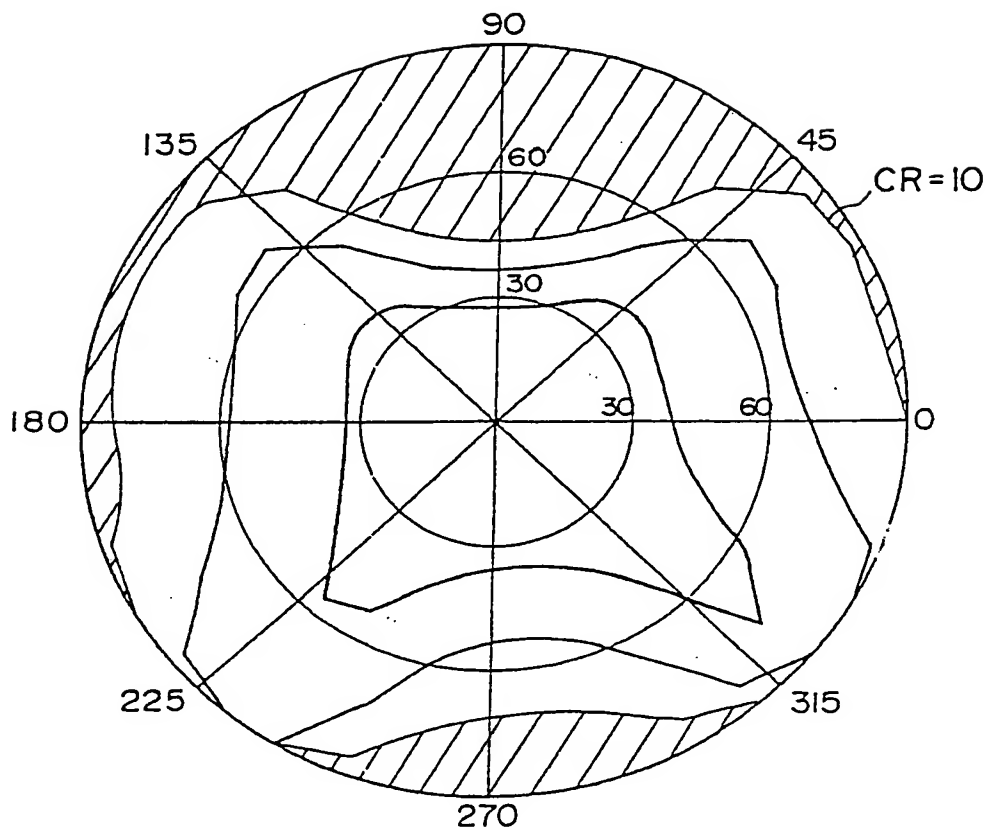
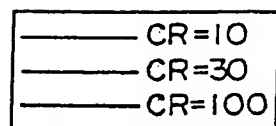
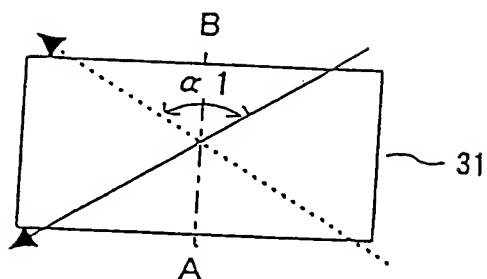


FIG 81

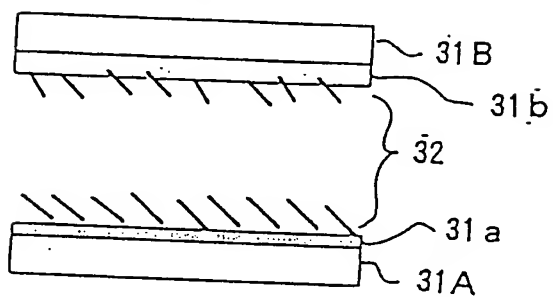
FIG. 61



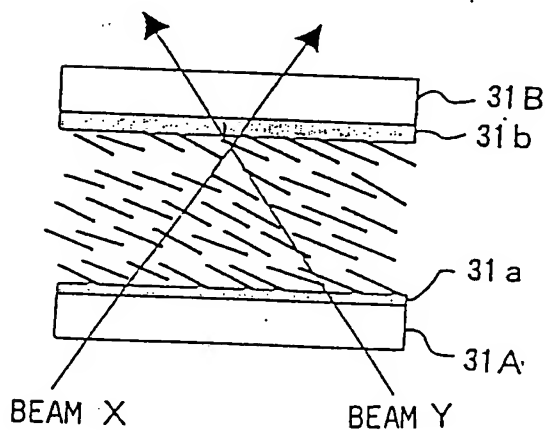
82A  
 FIG. 62A



82B  
 FIG. 62B

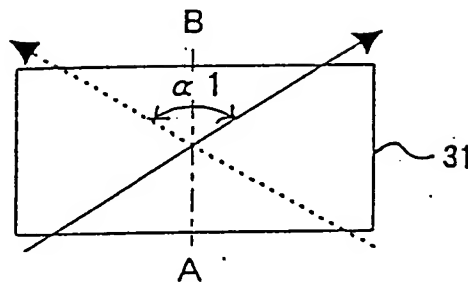


82C  
 FIG. 62C

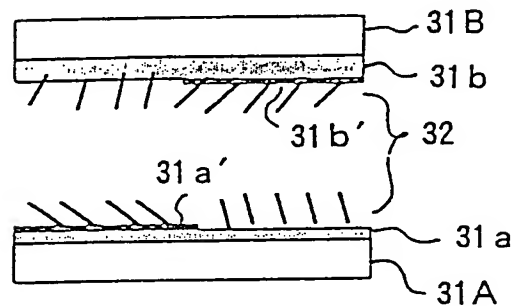


126

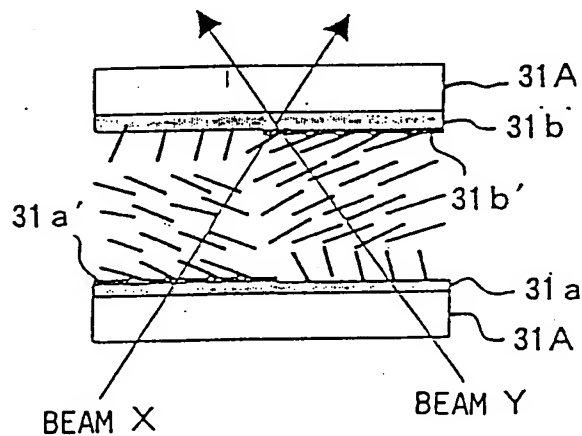
83A  
FIG. 63A



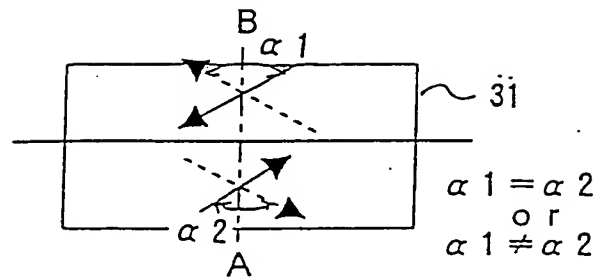
83B  
FIG. 63B



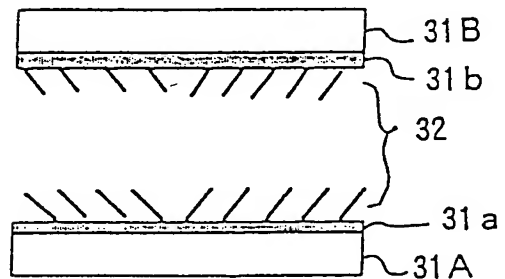
83C  
FIG. 63C



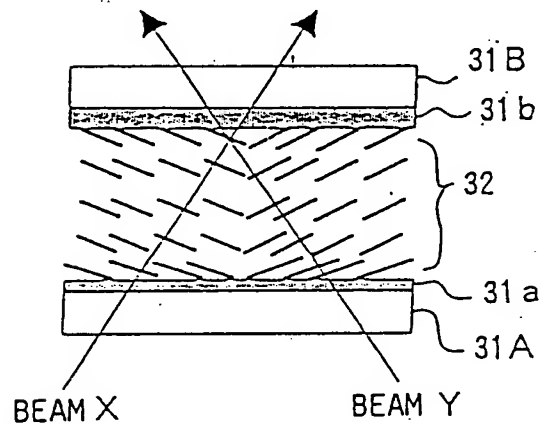
84A  
 FIG. 64A



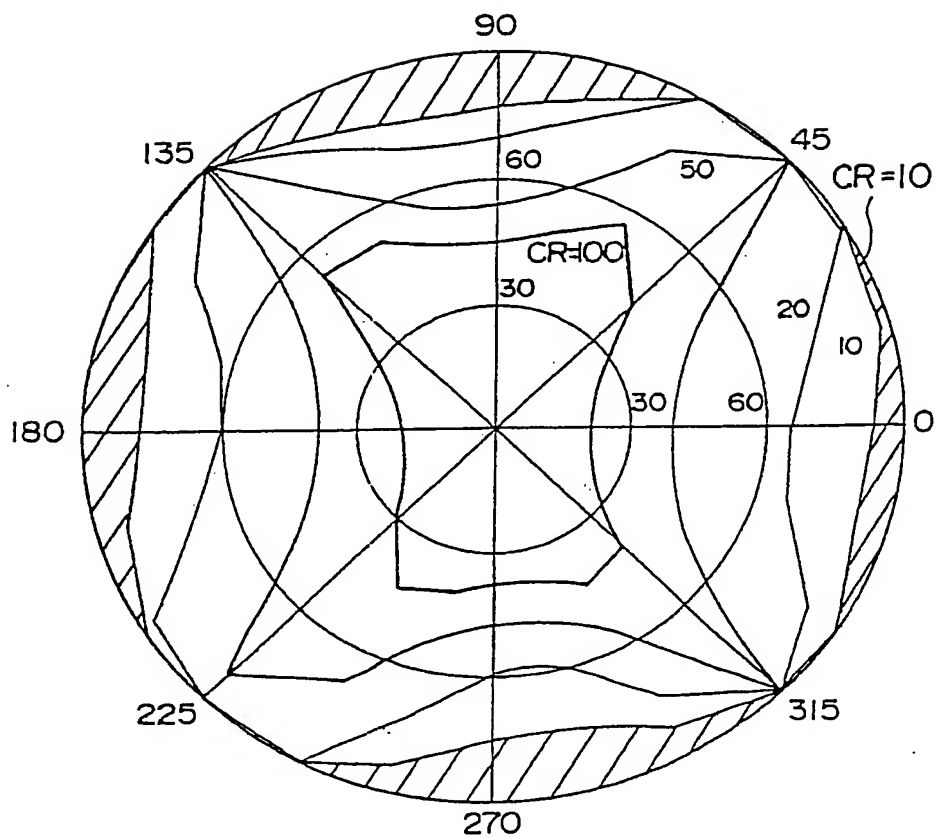
84B  
 FIG. 64B



84C  
 FIG. 64C

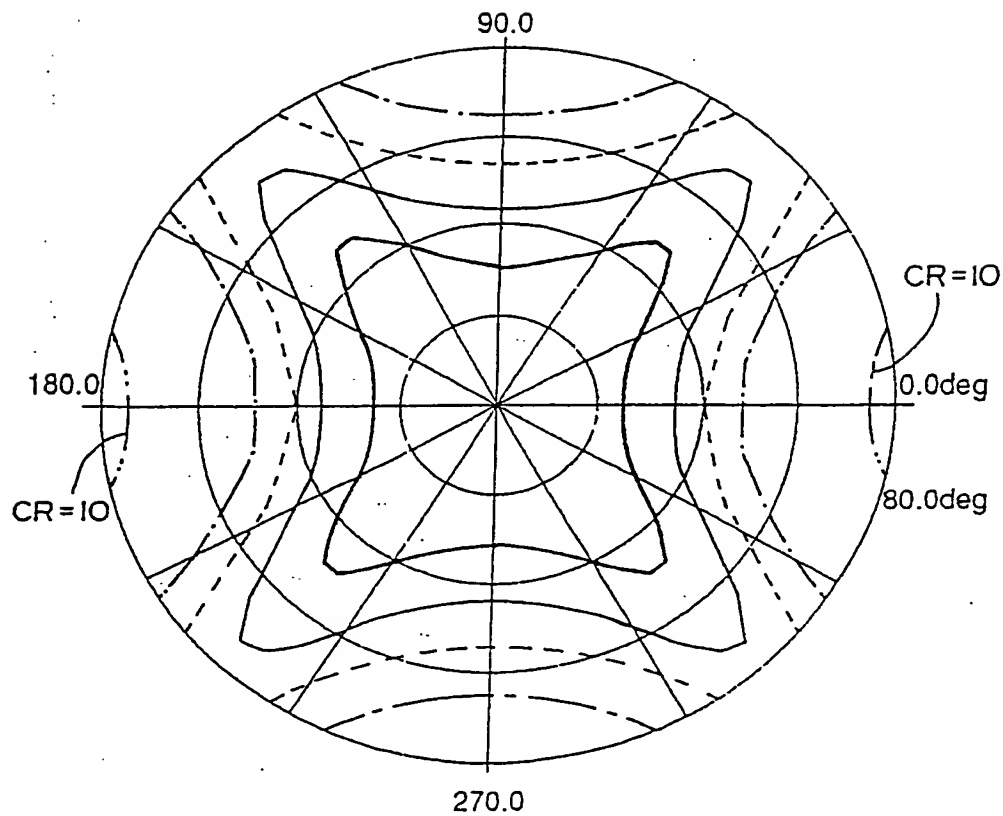


85  
FIG. ~~65~~

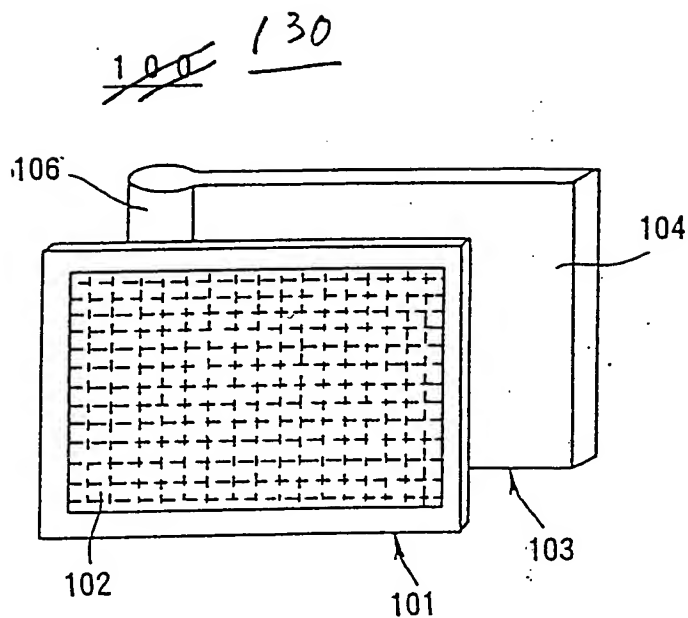


86  
FIG. 86

Contrast ratio	
————	500.000
————	200.000
-----	100.000
- . - . -	50.000
- - - - -	10.000

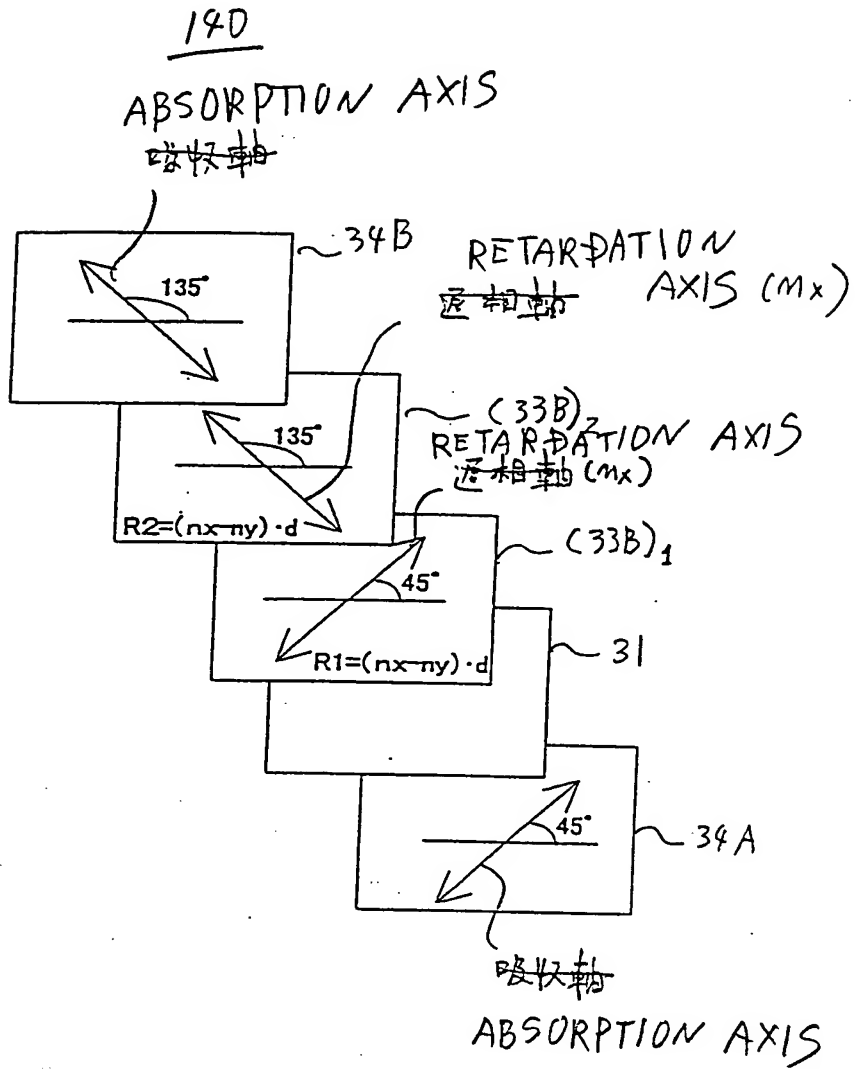


87  
FIG. 67



[12]88]

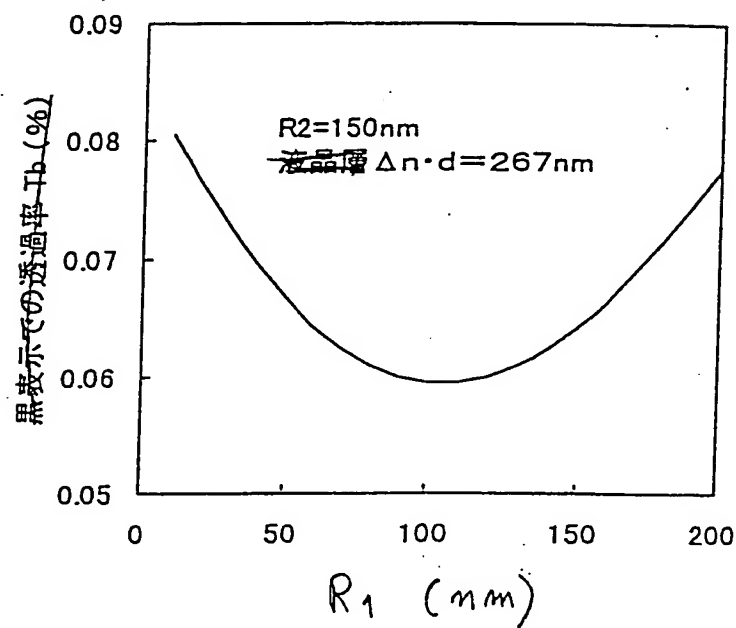
FIG 88



089

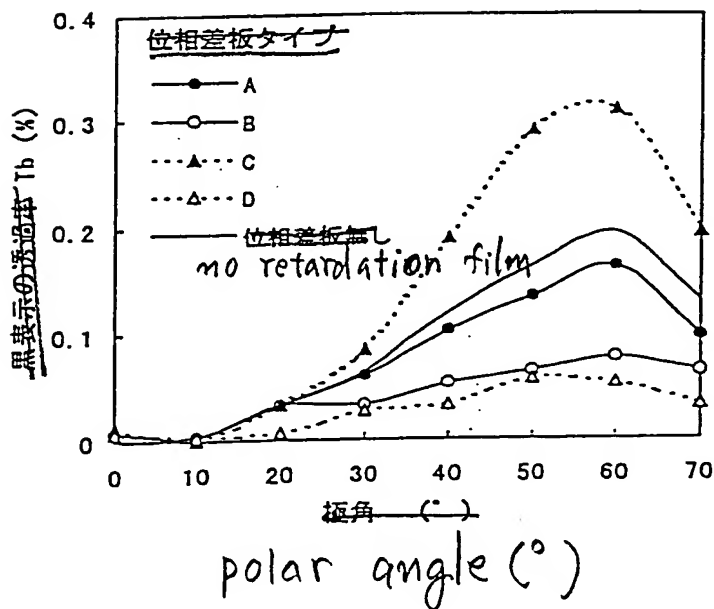
FIG 89

BLACK-MODE TRANSMITTANCE  $T_b$  (%)



[12]90]

FIG 90



[129]

FIG 91A  
(A)

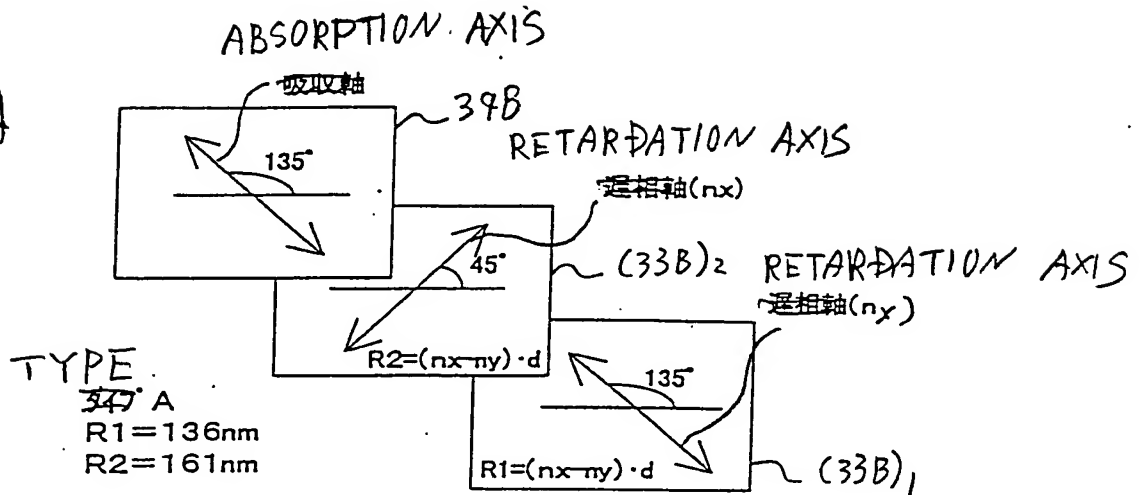
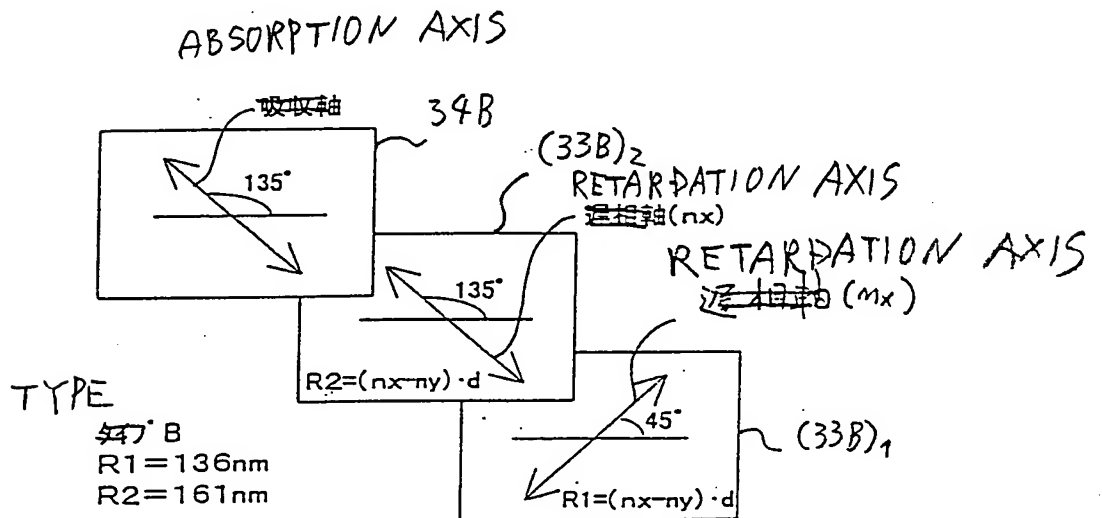


FIG 91B  
(B)



[92]

FIG 91C  
(C)

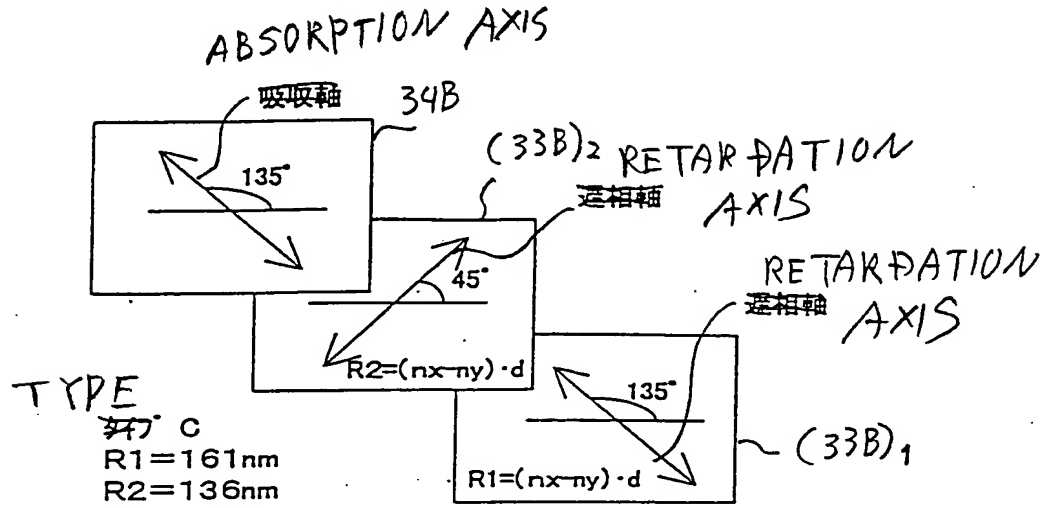
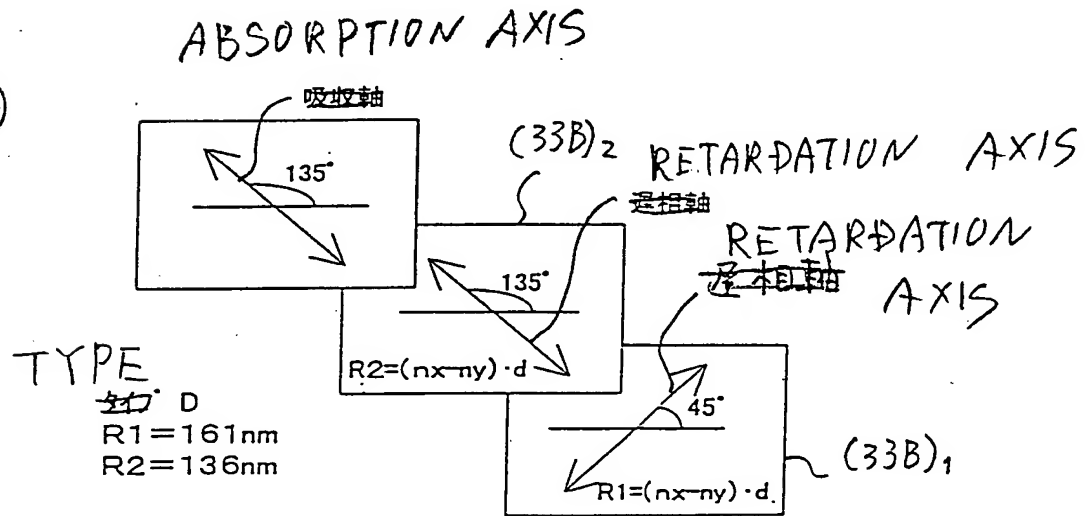


FIG 91D  
(D)



[1993]

FIG 92A

(A)

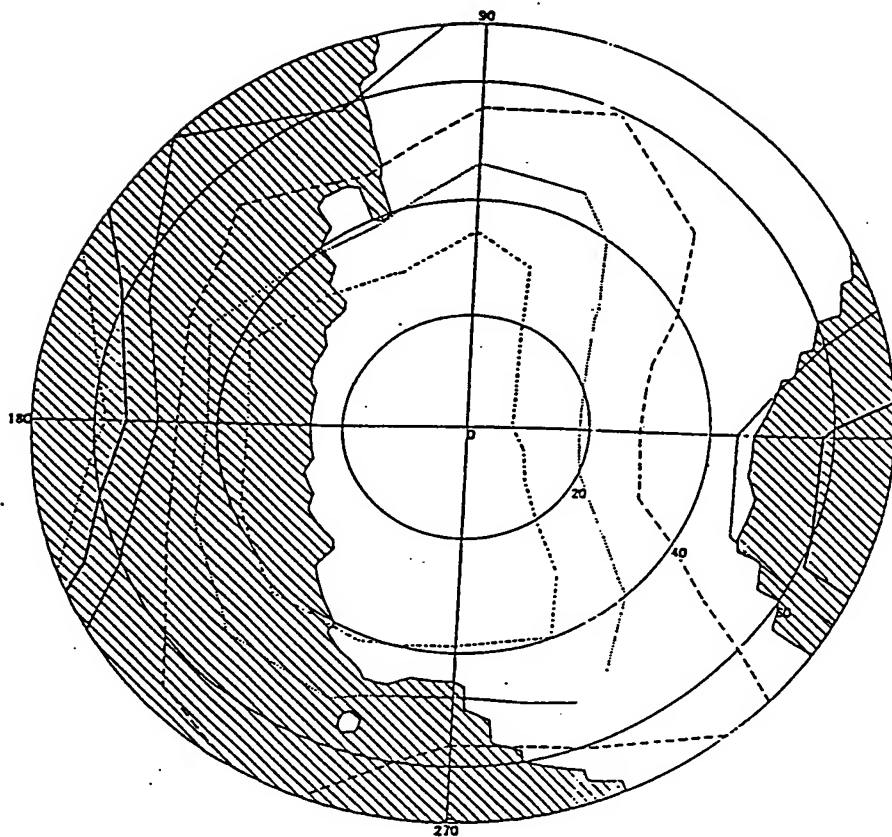
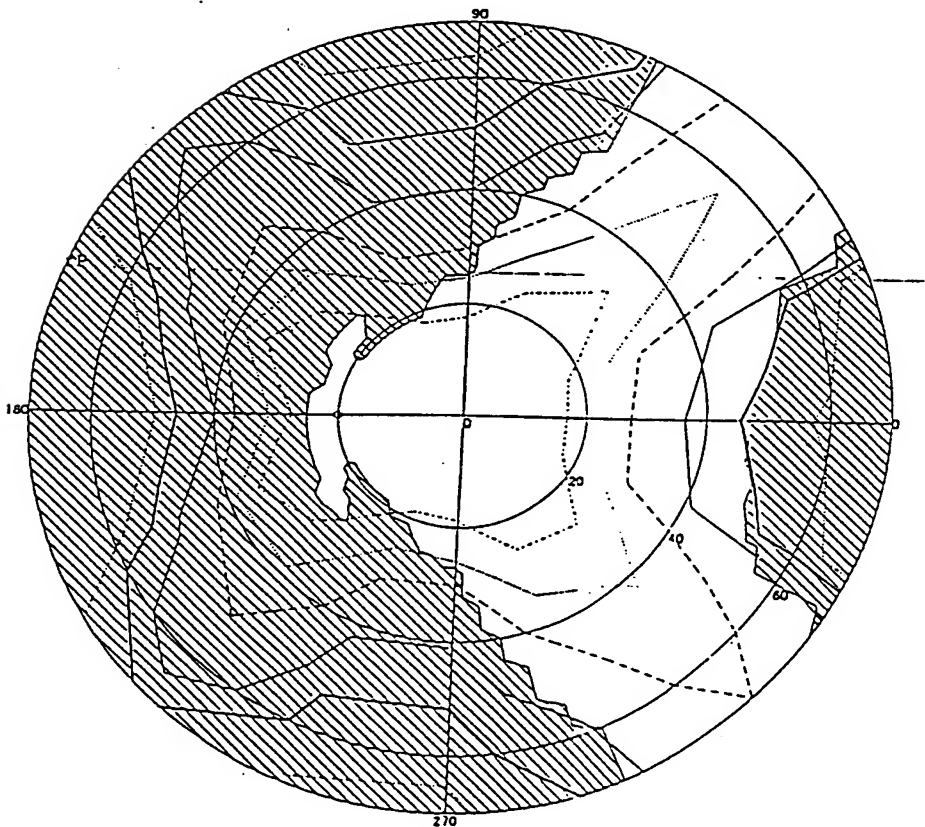


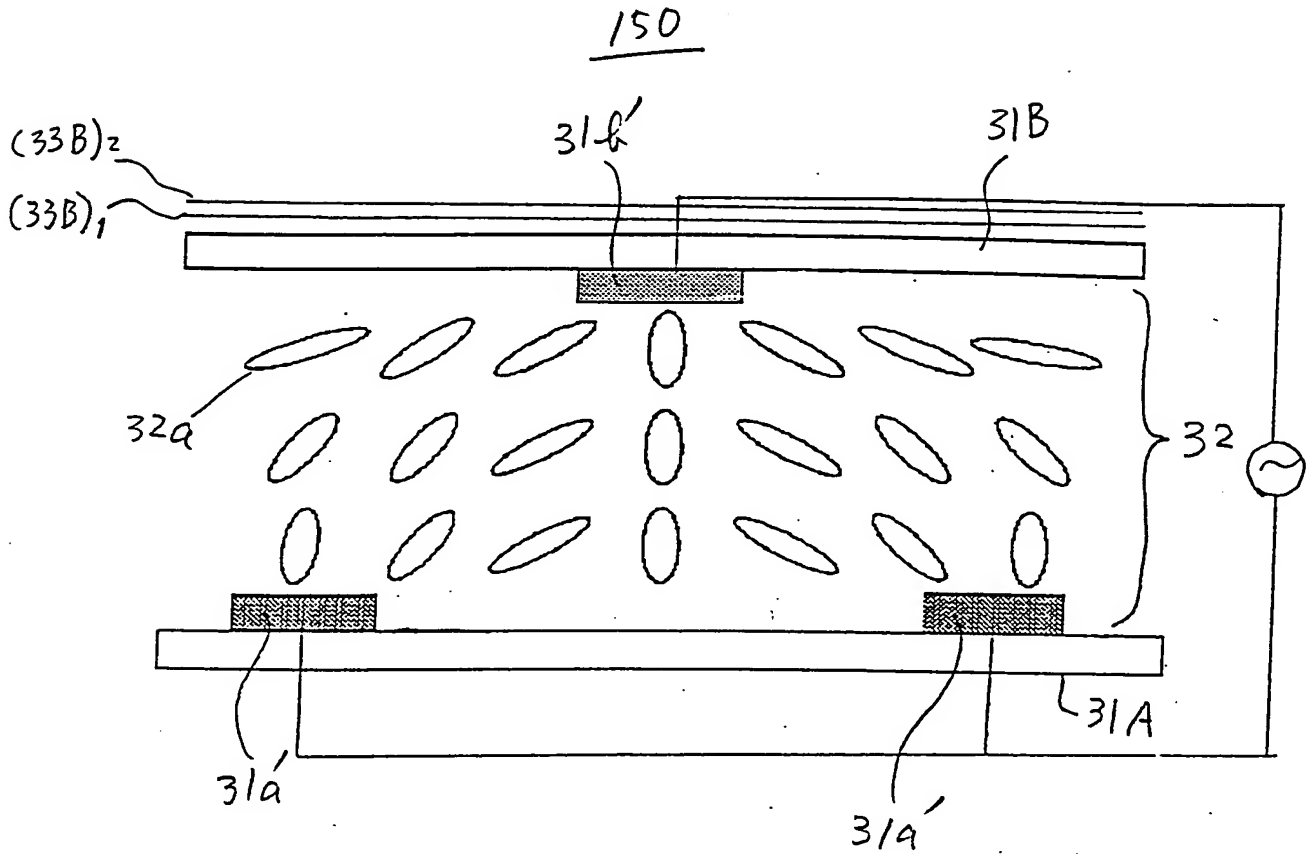
FIG 92B

(B)



[12] 94]

FIG 93



[295]

FIG 94

Contrast ratio	
—————	500.000
—————	200.000
—————	100.000
—————	50.000
—————	10.000

